

ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1

OPERATOR'S MANUAL FOR:

MORTAR, 81-MM, M252

(1015-01-164-6651)

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HEADQUARTERS U.S. MARINE CORPS
OCTOBER 1987

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SAW

RADIATION HAZARD



TRITIUM (H₃)

This item contains radioactive materiel. Control of this radioactive materiel is mandated by Federal law. Immediately report any suspected lost or damaged items to your Radiation Protection Officer. If your Radiation Protection Officer cannot be reached, contact the TACOM-RI safety office during regular duty hours; or call the Rock Island Police office at DSN 793-6135 after duty hours.

A. RULES AND REGULATIONS: Copies of the following rules and regulations are maintained at TACOM-RI, Rock Island, IL 61299-7630. Copies may be requested or information obtained by contacting the TACOM-RI Radiation Protection Officer (RPO), DSN 793-2962/2965, Commercial (309) 782-2962/2965.

- (1) 10CFR Part 19 - Notices, Instructions and Reports to Workers; Inspections.**
- (2) 10CFR Part 20 - Standards for Protection Against Radiation.**
- (3) 10CFR Part 21 - Reporting of Defects and Noncompliance.**
- (4) NRC license, license conditions, and license application.**

WARNING

B. SAFETY PRECAUTIONS: The radioactive material used in these instruments is tritium gas (H_3) sealed in glass tubes. These sources illuminate the instrumentation for night operations. Tampering with, or removal of, the sources in the field is prohibited by Federal law. In the event there is no illumination, notify the local RPO or TACOM-RI RPO. If skin contact is made with any area contaminated with tritium, wash immediately with soap and water.

The beta radiation emitted by tritium is a hazard only if the vial or source is broken. Tritium can be taken into the body by inhalation, ingestion, or skin absorption/injection. If the vial is broken, the tritium gas will dissipate into the surrounding air. If released in a confined space such as a storage locker, container, unventilated room, or military vehicle, tritium is absorbed by lungs from air or by skin contact with contaminated surfaces. However, the body naturally eliminates absorbed tritium.

C. IDENTIFICATION: Instruments containing radioactive self-luminous vials are identified by means of radioactive warning labels (see page a). These labels should not be defaced or removed, and should be replaced immediately when necessary using instruction decal (item 17, app D). Refer to the local RPO or the TACOM-RI RPO for instructions on handling, storage, or disposal.

WARNING

D. STORAGE: Spare equipment must be stored in the shipping container, as received, until installed on the weapon. Storage of these items is recommended to be in an outdoor shed-type storage or unoccupied building.

E. SHIPPING: All radioactively illuminated instruments will be evacuated to the appropriate echelon for inspection and repair. Non-illuminated instruments will be disposed of as radioactive waste. Contact installation Radiation Protection Officer.

F. EMERGENCY PROCEDURES: If a source breaks or is not illuminated, follow "SWIMN":

Stop - and think.

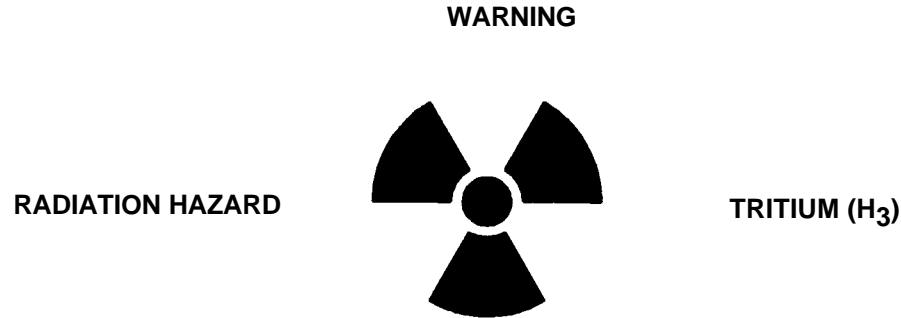
Warn - nearby personnel of situation to avoid additional exposure. Immediately open doors/hatches if exiting room/vehicle/area is not possible. If exiting, move upwind for 15 minutes.

Isolate - Do not handle broken tritium devices with bare hands. Use gloves (if available) or a bag. Quickly place item in plastic bag (item 2, app D) (or, if bag not immediately available, wrap in plastic) and, if possible, leave area.

Minimize - wash hands.

Notify - call the Radiation Protection Officer (RPO).

G. SPECIAL HANDLING: Radioactive material is used in the M58/M59 aiming post lights and M67 sight unit. Radiation leakage may occur if broken or damaged. If exposed to a broken or damaged instrument, see medical personnel.



Radioactive contamination may occur if vials containing tritium gas are broken. If breakage occurs or if illumination is not present, notify the local radiological protection officer or chemical biological radiological (CBR) officer. See instructions on preceding pages on evacuation of the item to a depot maintenance activity.

-
- The following prescribed head positions must be observed during all loading and firing operations:
Gunner's head should be .68 meters (27 in.) above the ground and .75 meters (30 in.) from the muzzle on a 215 degree radial from the muzzle.
Loader's head should be .8 meters (32 in.) above the ground and .95 meters (37 in.) from the muzzle on a 155 degree radial from the muzzle. See pages g and h for position illustrations.
 - **Firing site must have enough mask clearance and no overhead obstructions.**
 - **Dented barrels must be replaced as they are unsafe for firing.**
 - **Upon releasing cartridge, pass hands downward and, at the same time, turn away from muzzle of mortar cannon to prescribed body and head position, to avoid blast which occurs when cartridge fires.**
 - **Do not look into cannon, and do not try to force a cartridge down cannon.**

- **Weapon is not to be fired without blast attenuator device.**
- **The exterior surface of the cannon between the upper and lower stop bands must be wiped free of lubrication prior to firing. If this portion is not dry, the barrel clamp assembly may move excessively on the barrel during firing.**
- **Firing ammunition in a heavily lubricated bore can result in hangfires or failures to fire.**
- **Mortar crew is required to use single hearing protection during firing.**
- **Do not stand directly behind cannon when removing a misfire.**
- **Keep head and body away from the front of the mortar when removing a misfire.**
- **When removing a misfire, do not open barrel clamp assembly, only loosen it.**
- **Do not lower breech plug end of cannon below a horizontal position until cartridge has been removed from cannon.**

d Change 2

WARNING

- Ammo handler must not put his hand on the breech plug when lifting and holding cannon during misfire procedures.
- If kicking the barrel does not cause the cartridge to fire during a misfire and the mortar is hot, wait until the mortar is cool enough to move with bare hands, or if the mortar is cool at the time of the misfire, wait one minute before removing the cartridge. Water or snow applied to the outside of the barrel can be used for cooling. This is to avoid an accident from possible delayed action of the ignition cartridge.
- Follow misfire procedures on page 2-68 to remove round before doing troubleshooting.
- All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.

WARNING

- Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than seven feet could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the ASP as unserviceable
- • The mortar crew must have adequate cover for protection from fragments when firing to ranges of 400 meters or less.
- Unauthorized assembly and use of cartridges is extremely dangerous.
- Handle explosive ammunition and components containing explosives with utmost care. Do not drop, drag, throw, tumble, or strike packaged or unpackaged ammunition or related components. Attempts to fire ammunition that has been roughly handled is extremely dangerous.

WARNING

Ammunition exposed directly to sunlight or in unventilated containers, enclosures, shelters, freight cars, closed vehicles, and similar structures exposed to direct sunlight, may reach temperatures exceeding upper storage limits. Avoid exposure of ammunition and related components to direct sunlight.

Do not fire ammunition through overhead obstructions or over the heads of unprotected personnel.

Do not fire ammunition with damaged fins, leaking or missing propellant containers, damaged obturators, or damaged fins.

Loading a mortar weapon with two men (alternately) can be very dangerous and could prove fatal. Even with one-man loading, double loading can occur. This is especially true in rapid fire exercises. For this reason, it is imperative that there be absolute certainty that the previous round left the mortar tube before a new round is dropped in.

Never put hands in front of the muzzle.

When moving cannon always point in direction of fire and ensure that no crew members stand directly behind or in front of cannon.

WARNING

- PD and proximity fuzes may prematurely function when fired through extremely heavy rainfall.
- Do not fire ammunition in temperatures above +145°F (+63°C) or below -50°F (46°C).
- Short rounds may occur if an excessive amount of oil or water is in barrel during firing.
- Do not store ammunition under trees or next to towers or other structures that attract lightning.
- Do not hammer on fuze wrench or use an extension on handle.
- Fuze must be fully seated onto projectile body. Do not stake fuze.
- Use only authorized fuze combinations.
- Propelling charges are not interchangeable. Do not substitute one model for another. Do not mix lots.

WARNING

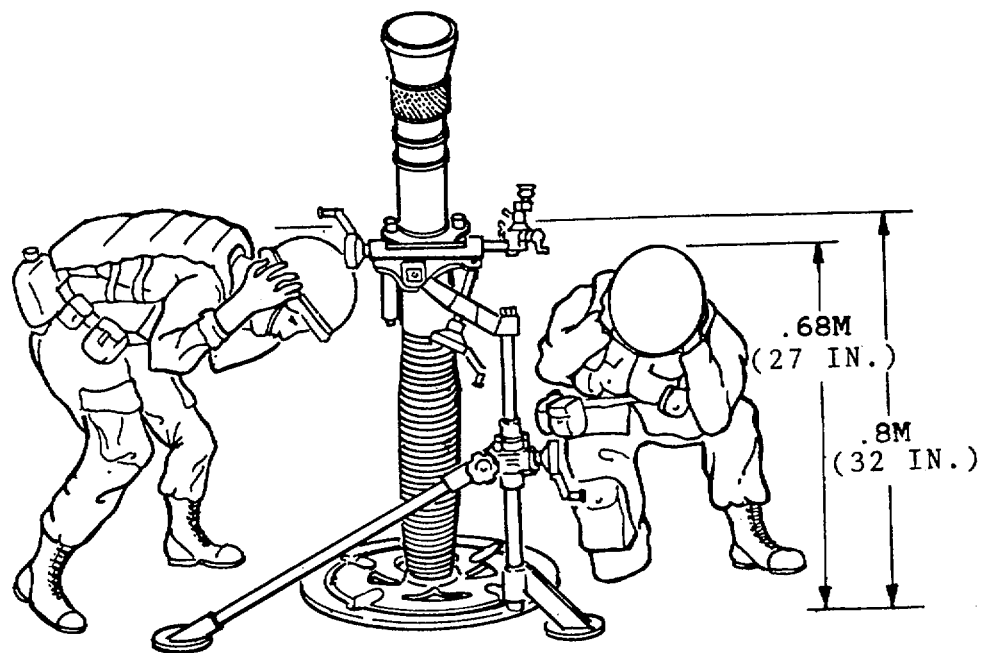
- Reposition remaining propellant increments towards rear of fin assembly when firing M821 HE, M889 HE, M374A3 HE, M375A3 WP, M819 RP, M853 Illum, or M879 TP cartridges with less than full charge (4 increments).
- Charge A increment of the M90 and M90A1 propelling charge must be used when firing above charge 0.
- When burning excess increments:
 - Burning area must be at least 100 meters from the nearest mortar position, parked vehicles, and ammunition piles.
 - Burning area shall be cleared of all dead grass or brush within 30 meters.
- For more information on ammunition, refer to TM 9-1300-206.
- Dry cleaning solvents (SD) and paint thinners (TPM) are flammable. Do not clean parts near an open flame or in a smoking area. Dry cleaning solvents and paint thinners evaporate quickly and have a drying effect on the skin. When used without protective gloves, these chemicals may irritate or crack the skin.

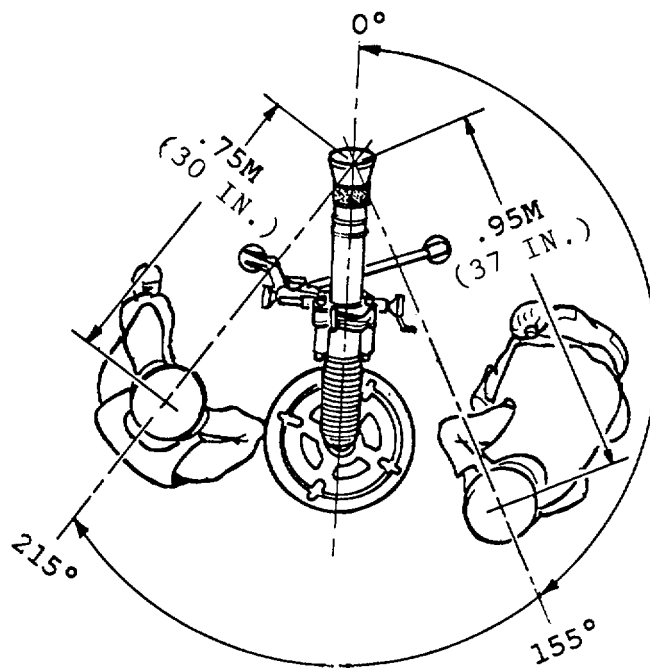
WARNING

- For more information on first aid, refer to FM 4-25.11, First Aid, dated 23 December 2002.

ACCIDENTS AND MALFUNCTION REPORTS (Marine Corps Only)

- Accidents involving injury to personnel or damage to the equipment will be reported in accordance with current edition of MCO P5102.1_ (Ground Mishaps Report).





Double loading of mortar ammunition has resulted in catastrophic accidents. Loading a mortar weapon with two men (alternately) can be very dangerous and could prove fatal. Even with one-man loading, double loading can occur. This is especially true in rapid fire exercises. For this reason, it is imperative that there be absolute certainty that the previous round left the mortar tube before a new round is dropped in.

WARNING

Improved BCO series ammunition, M821, M889, M853A1, M819, and M879, develop significantly higher pressures in the weapon than earlier 300 series ammunition. When using 800 series ammunition with the M29 or M29A1 Mortar System, **DO NOT EXCEED CHARGE 3**. (For training purposes, this limit may be further reduced-refer to specific ammunition restrictions.). Do not use 800 series ammunition with the M1 Mortar. Serious injury or death may result from tube failure.

**- WARNING -
DO NOT USE IN M1 MORTAR
DO NOT EXCEED CHARGE 3 IN M29 MORTAR**

On early production of M821 and M889 ammunition, the above label was attached to the cartridge behind the fuze. This label may reduce cartridge accuracy, especially when fired at high charge. If possible, remove the label prior to firing. Later production lots contain a stencil in lieu of a label. Always read warnings on cartridge prior to firing. If this warning is not present, check other rounds in ammunition box.

j Change 2

WARNING

When firing the M252 Mortar System at elevation exceeding 1423 mils, observe the following restrictions:

On ammunition with four propelling charges (horseshoe increments): Do not fire cartridge above charge 1.

On ammunition with more than four propelling charges (bags): Do not fire cartridge above charge 3.

Short rounds may occur due to excessive weapon movement unless these restrictions are followed.

Firing M374A2, M375A1, and M375A2 cartridges in inclement weather (rain/snow) is not advisable. Critical short rounds may occur when propelling charge bags are wet or have previously been exposed to moisture.

Inspect M751 and M775 Practice Fuzes to ensure that fuze striker is not protruding from nose of fuze so that red stripe is visible. If fuze striker is protruding so that red stripe is visible, fuze may be armed. Force applied to nose of fuze may cause it to function. Remove cartridge to dud pit, taking care not to strike nose of fuze, and notify EOD.

ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C10

HEADQUARTERS
DEPARTMENT OF THE ARMY

WASHINGTON, D.C. 20 February 2006

Change
No. 10

**OPERATOR'S MANUAL FOR:
MORTAR, 81-MM, M252
(1015-01-164-6651)**

DISTRIBUTION STATEMENT C - Distribution authorized to U.S. Government agencies and their contractors. This publication is required for administration and operational purposes, as determined 16 September 1994. **ARMY**: Other requests for this document will be referred to ATTN: AMSTA-LC-LPIT, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. **MARINE CORPS**: Requests for this document will be referred to: Commandant of the Marine Corps (ARD), Washington, D.C. 20380-0001. **AIR FORCE**: Requests for this document will be referred to WR-ALC/TILTB, Robins AFB, GA 31098-1640.

ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C10

Army TM 9-1015-249-10, 30 October 1987, is changed as follows:

1. Remove old pages and insert new pages indicated below.
2. New or changed material is indicated by vertical bar in the margin of the page. Illustration changes are indicated by a pointing hand adjacent to the illustrations.

Remove Pages

a through b.1/(b.2 blank)
f.1 and f.2
A through D
i through ii.1/(ii.2 blank)
(v blank)/1-0 through 1-4
1-7 and 1-8
1-9 and 1-10

Insert Pages

a through b.1/(b.2 blank)
f.1 and f.2
A through E/(F blank)
i through ii.1/(ii.2 blank)
(v blank)/1-0 through 1-4
1-7 and 1-8
1-9 and 1-10

Remove Pages

2-1 through 2-8
(2-17 blank)/2-18 through 2-24
(2-39 blank)/2-40 through 2-56
2-59 through 2-64
2-79 and 2-80
A-1 and A-2
B-5 through B-12
D-5 through Index-4
Front Cover

Insert Pages

2-1 through 2-8
(2-17 blank)/2-18 through 2-24
(2-39 blank)/2-40 through 2-56
2-59 through 2-64
2-79 and 2-80
A-1 and A-2
B-5 through B-12
D-5 through Index-4
Front Cover

3. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army and Commandant of the Marine Corps:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

R. P. SHOCKEY
Director, Program Support
Marine Corps Systems Command

OFFICIAL:

A handwritten signature in black ink that reads "Sandra R. Riley". The signature is fluid and cursive, with the first name "Sandra" being the most prominent.

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army

0534204

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ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C9

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 15 March 2005

Change
No. 9

**OPERATOR'S MANUAL FOR:
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(1015-01-164-6651)**

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ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C9

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Remove Pages

k/(I blank)
A through D
i through ii.1/(ii.2 blank)
4-23 through 4-26
4-29 and 4-30
Front Cover

Insert Pages

k/(I blank)
A through D
i through ii.1/(ii.2 blank)
4-23 through 4-26
4-29 through 4-30.1/(4-30.2 blank)
Front Cover

3. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army and Commandant of the Marine Corps:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

R. P. SHOCKEY
Director, Program Support
Marine Corps Systems Command

Official:


SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army

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ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C8
HEADQUARTERS
DEPARTMENT OF THE ARMY

WASHINGTON D.C., 1 SEPTEMBER 2001

Change
No. 8

**OPERATOR'S MANUAL FOR:
MORTAR, 81-MM, M252
(1015-01-164-6651)**

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Army TM 9-1015-249-10, 30 October 1987, is changed as follows:

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AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C8

1. Remove old pages and insert new pages indicated below.
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Remove Pages

None
k/(l blank)
2-7 and 2-8
2-22.1/(2-22.2 blank)
2-23 and 2-24
2-27 and 2-28
4-27 and 4-28
B-11 and B-12
D-5 and Index-0

Insert Pages

A through D
k/(l blank)
2-7 and 2-8
2-22.1/(2-22.2 blank)
2-23 through 2-24.1/(2-24.2 blank)
2-27 and 2-28
4-27 and 4-28
B-11 and B-12
D-5 and Index-0

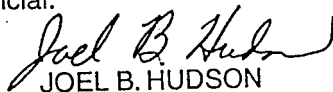
3. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army and Commandant of the Marine Corps:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

R. P. SHOCKEY
Director, Program Support
Marine Corps Systems Command

Official:

Handwritten signature of Joel B. Hudson in black ink.

JOEL B. HUDSON
*Administrative Assistant to the
Secretary of the Army*

0120404

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ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C7

HEADQUARTERS
DEPARTMENT OF THE ARMY

WASHINGTON, D.C., 30 OCTOBER 1998

Change
No. 7

**OPERATOR'S MANUAL FOR:
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(1015-01-164-6651)**

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Army TM 9-1015-249-10, 30 October 1987, is changed as follows:

1. New change now includes the Air Force as a user of this TM.

ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09922A-10/1
C7

2. Remove old pages and insert new pages indicated below.
3. New or changed material is indicated by vertical bar in the margin of the page. Illustration changes are indicated by a pointing hand adjacent to the illustrations.

Remove Pages

a and b
None
d.1 and d.2
e and f
i and ii
2-22.1/(2-22.2 blank)
2-66.1/(2-66.2 blank)
None
2-83 and 2-84
3-3 and 3-4

Insert Page

a and b
b.1/(b.2 blank)
d.1 and d.2
e through f.2
i through ii.1/(ii.2 blank)
2-22.1/(2-22.2 blank)
2-66.1/(2-66.2 blank)
(2-82.1 blank)/2-82.2
2-83 and 2-84
3-3 and 3-4

ARMY TM 9-1015-249-10
AIR FORCE TO 11W2-5-21-1
MARINE CORPS TM 09222A-10/1
C7

Remove Page

B-5 and B-6
B-9 through B-20
Front Cover

Insert Page

B-5 and B-6
B-9 through B-20
Front Cover

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By Order of the Secretary of the Army:

Official:

Handwritten signature of Joel B. Hudson in black ink.

JOEL B. HUDSON

Administrative Assistant to the
Secretary of the Army
05132

DENNIS J. REIMER
General, United States Army
Chief of Staff

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URGENT CHANGE

CHANGE
No. 6

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DEPARTMENT OF THE ARMY
Washington, D.C., 30 September 1996

OPERATORS' S MANUAL FOR MORTAR, 81-MM, M252 (1015-01-164-6651)

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1. Remove old pages and insert new pages as indicated below:
2. New or changed material is indicated by vertical bar in the margin of the page.

Remove Pages

None
e and f
None
None
4-27 and 4-28

Insert Pages

d.1 and d.2
e and f
2-66.1/(2-66.2 blank)
4-26.1 and 4-26.2
4-27 and 4-28

3. File this change sheet in the back of the publication for reference purposes.

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
02590

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Change

No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 February 1995

Operator's Manual
for
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(1015-01-164-6651)

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Remove Pages

a and b
i through iv
1-1 and 1-2
(2-7 blank) 2-8 through 2-10

Insert Pages

a and b
i through iv
1-1 and 1-2
2-7 through 2-10

Remove Pages

2-15 and 2-16
2-22.1 (2-22.2 blank)
2-25 and 2-26
2-33 and 2-34
2-63 through 2-68
2-81 and 2-82
3-1 through 3-6
3-11 through 3-14
3-15 through 4-0
none
none
4-5 and 4-6
none
4-17 through 4-24
4-28.1/(4-28.2 blank)
B-3 through Index-5/(Index 6 blank)

Insert Pages

2-15 and 2-16
2-22.1/(2-22.2 blank)
2-25 and 2-26
2-33 and 2-34
2-63 through 2-68
2-81 and 2-82
3-1 through 3-6
3-11 through 3-14
3-15 through 4-0
4-0.1/(4-0.2 blank)
4-2.1 and 4-2.2
4-5 and 4-6
4-16.1 and 4-16.2
4-17 through 4-24
4-28.1 and 4-28.2
B-3 through Index-4

3. File this change sheet in back of the publication for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
07908

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No. 4

Operator's Manual
for
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(1015-01-164-6651)

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1. Remove old pages and insert new pages as indicated below:

Remove Pages

e and f
1-3 and 1-4
1-7 and 1-8
1-8.1/(1-8.2 blank)

Insert Pages

e and f
1-3 and 1-4
1-7 and 1-8
1-8.1/(1-8.2 blank)

Remove Pages

2-11 and 2-12
2-22.1 (2-22.2 blank)
2-23 and 2-24
2-29 (2-30 blank)
2-31 and 2-32
2-41 and 2-42
2-45 and 2-46
2-51 and 2-52
2-55 and 2-56
2-57 and 2-58
2-65 and 2-66
2-69 and 2-70
2-73 and 2-74
2-77 and 2-78

Insert Pages

2-11 and 2-12
2-22.1 (2-22.2 blank)
2-23 and 2-24
2-29 (2-30 blank)
2-31 and 2-32
2-41 and 2-42
2-45 and 2-46
2-51 and 2-52
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(1015-01-164-6651)

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1-2	5	2-19 through 2-22.....	10
1-3	10	2-22.1/(2-22.2 blank).....	10
1-4	4	2-23 and 2-24.....	10
1-5 and 1-6	0	2-24.1/(2-24.2 blank).....	8
1-7 and 1-8	10	2-25	0
1-8.1/(1-8.2 blank)	4	2-26	5
1-9	10	2-27	0
1-10 through 2-0	0	2-28	8
2-1 and 2-2	10	2-29 (2-30 blank).....	4
2-3	0	2-31	0
2-4 through 2-7	10	2-32	4
2-8	8	2-33	5
2-9 and 2-10	5	2-34 through 2-38.....	0
2-11	0	(2-39 blank)/2-40	10

Page / WP No.	*Change No.
2-41	0
2-42 through 2-44	10
2-45	0
2-46	10
2-47	0
2-48 through 2-52	10
2-53	0
2-54 through 2-56	10
2-57	4
2-58 and 2-59	0
2-60	10
2-61	0
2-62	10
2-63	0
2-64	10
2-65 and 2-66	5
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2-67 and 2-68	5
2-68.1 and 2-68.2	2
2-69	0

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2-70	4
2-71	0
2-72	2
2-73	4
2-74	2
2-75 through 2-77	0
2-78	4
2-79	10
2-80 and 2-81	0
2-82	5
(2-82.1 blank)/2-82.2 and 2-83..	7
2-84 and 2-85	0
2-86 through 2-92	2
3-1	5
3-2	0
3-3	5
3-4	7
3-5	0
3-6	5
3-7 through 3-11	0

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3-12 through 3-17	5	4-28.1 and 4-28.2	5
4-0 and 4-0.1/(4-0.2 blank)	5	4-29	4
4-1 and 4-2	2	4-30	9
4-2.1 and 4-2.2	5	4-30.1 Added	9
4-3 through 4-5	0	4-30.2 blank Added	9
4-6	5	4-31	0
4-7	0	4-32	4
4-8	2	4-33 through 4-54	0
4-9 through 4-16	0	5-1 through 5-3	0
4-16.1 through 4-17	5	A-0 and A-1	0
4-18	0	A-2	10
4-19 through 4-21	5	B-1 and B-2	0
4-22	0	B-3 and B-4	5
4-23	5	B-5	7
4-24	9	B-6 and B-7	10
4-25	0	B-8	5
4-26	9	B-9	10
4-26.1 and 4-26.2	6	B-10	5
4-27	8	B-11	10
4-28	6	B-12	5

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B-15	7
B-16	5
B-17	7
B-18	5
B-19	7
B-20 through B-23	5
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D-3	0
D-4 and D-4.1/(D-4.2 blank)	5
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Index-0	10
Index-1	5
Index-2 and Index-3	10
Index-4	5

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NO. 9-1015-249-10
NO. 11W2-5-21-1
NO. 09922-10/1**

**ARMY TM 9-1015-249-10
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Washington D.C., 30 October 1987

**OPERATOR'S MANUAL
FOR
MORTAR, 81-MM, M252
(1015-01-164-6651)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <https://aeps.ria.army.mil>. The DA Form 2028 is located in the Public Applications section of the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax, or email your letter or DA Form 2028 direct to: AMSTA-LC-LPIT / TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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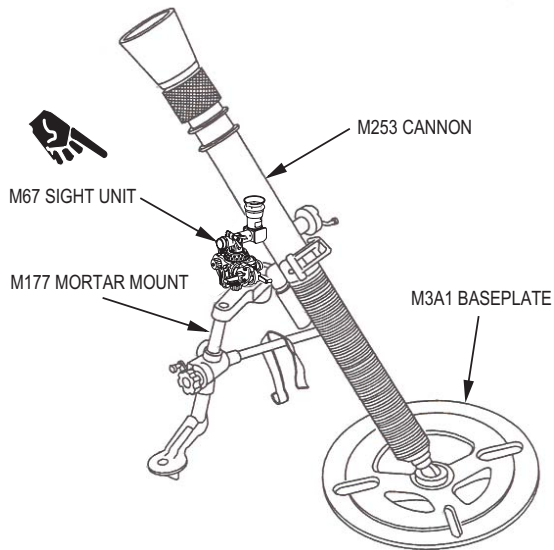
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TABLE OF CONTENTS

			Page
CHAPTER	1	INTRODUCTION	
Section	I	General Information.....	1-1
Section	II	Equipment Description.....	1-3
Section	III	Technical Principles of Operation	1-10
CHAPTER	2	OPERATING INSTRUCTIONS	
Section	I	Description and Use of Operators Controls and Indicators	2-0
Section	II	Preventive Maintenance Checks and Services (PMCS).....	2-7
Section	III	Operation Under Usual Conditions.....	2-29
Section	IV	Operation Under Unusual Conditions	2-84
CHAPTER	3	MAINTENANCE INSTRUCTIONS	
Section	I	Lubrication Instructions	3-1
Section	II	Troubleshooting Procedures	3-5
Section	III	Maintenance Procedures	3-14
CHAPTER	4	AMMUNITION	
Section	I	Authorized Cartridges	4-0
Section	II	Preparation for Firing.....	4-24
Section	III	Loading and Firing.....	4-27
Section	IV	Unfired Cartridges	4-29

TABLE OF CONTENTS (Cont)

			Page
Section	V	Care and Handling of Cartridges.....	4-31
Section	VI	Fuzes	4-33
Section	VII	Installation of Fuzes.....	4-38
Section	VIII	Fuze Setting.....	4-40
Section	IX	Resetting Fuzes.....	4-47
Section	X	Fuze Wrench/Setter.....	4-48
Section	XI	Propelling Charges	4-49
Section	XII	Adjustment of Propelling Charge	4-50
Section	XIII	Unused Propelling Charge Increments.....	4-53
CHAPTER	5	FOREIGN AMMUNITION (NATO)	
Section	I	General	5-1
Section	II	Authorized Cartridges	5-2
Section	III	Fuze Setting	5-2
Section	IV	Adjustment of Propelling Charge	5-3
APPENDIX	A	REFERENCES.....	A-0
APPENDIX	B	COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS	B-1
APPENDIX	C	ADDITIONAL AUTHORIZATION LIST.....	C-0
APPENDIX	D	EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	D-0
		ALPHABETICAL INDEX	Index-0



M252 81-MM MORTAR

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

SCOPE.

Type of Manual. Operator's.

Model Number and Equipment Name. M252 81-MM Mortar.

Purpose of Equipment. High-angle fire for close-in-support of ground troops.

MAINTENANCE FORMS AND RECORDS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

USMC users will refer to TM 4700.15/1.

HAND RECEIPT (-HR) MANUAL.

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 9-1015-249-10-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) that you must account for.

HAND RECEIPT (-HR) MANUAL - Continued.

As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in chapter 3, AR 310-2:

Commander
U.S. Army Adjutant General Publications Center
2800 Eastern Blvd.
Baltimore, MD 21220-2896

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your 81-mm mortar needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander, U.S. Army Armament Research, Development, and Engineering Center, ATTN: AMSTA-ARA-QAW (R), Rock Island, IL 61299-7300. We'll send you a reply.

USMC users shall submit SF 368 in accordance with MCO 4855.10.

WARRANTY INFORMATION.

Some mortars are under warranty. Contact the ARDEC Warranty Control Office (WARCO) for warranty information. Point of contact is SMCAR-QAH-P, DSN 880-5817, Commercial (201) 724-5817.

NOMENCLATURE CROSS-REFERENCE LIST.

This listing includes nomenclature cross-references used in this manual.

Common Name	Official Nomenclature
Bipod	Mortar mount
Cannon	Mortar barrel
Cross-leveling handwheel	Cross-leveling operating handle
Elevating handwheel	Elevating leg operating handle
Sight unit adapter	Adapter assembly
Traversing handwheel	Traversing gear operating handle

Section II. EQUIPMENT DESCRIPTION**EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.**

Equipment Characteristics. Provides high-angle fire for close range support of ground troops.

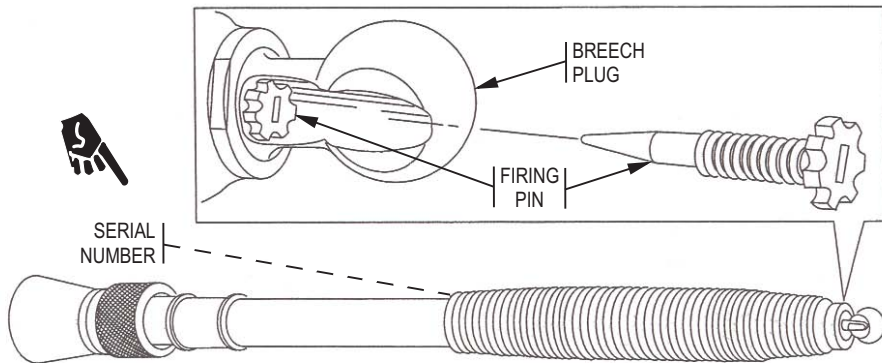
Capabilities and Features:

Muzzle-loading
High-angle fire
Portable
Smooth bore

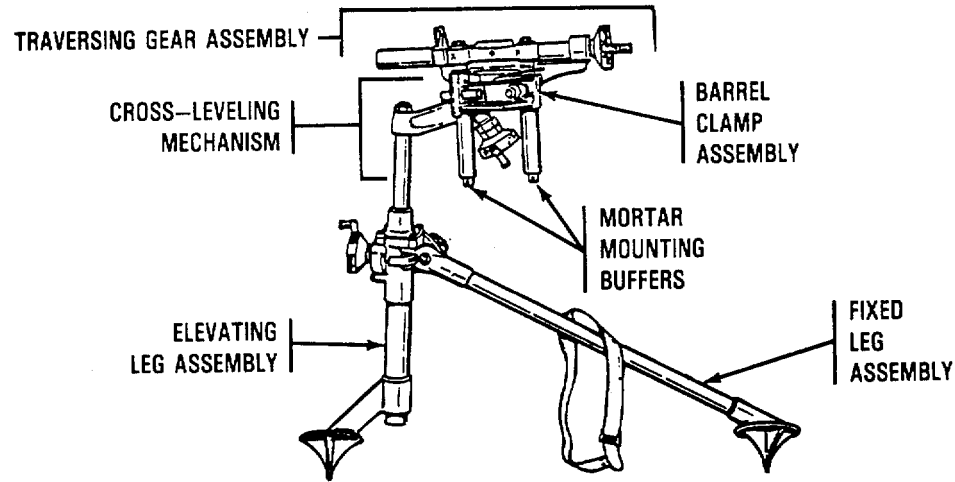
Major Weapon System Components:

- (a) M253 Cannon
- (b) M177 Mortar Mount (Bipod)
- (c) M3A1 Baseplate
- (d) M67 Sight Unit

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

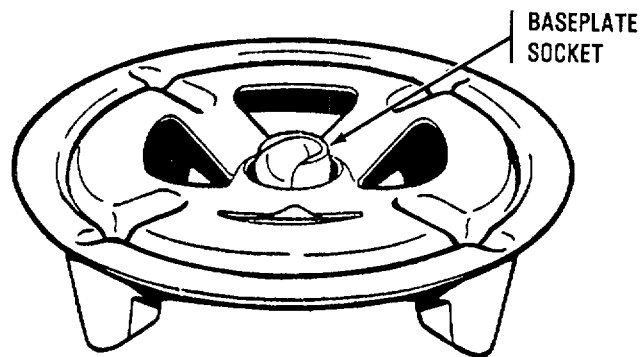


M253 CANNON. The cannon has a removable breech plug and firing pin. The muzzle end has a short tapered lead-in for the cartridge and a BAD (blast attenuator device). The breech end is finned for better cooling. The mortar serial number is engraved on the cannon directly above the cooling fins.

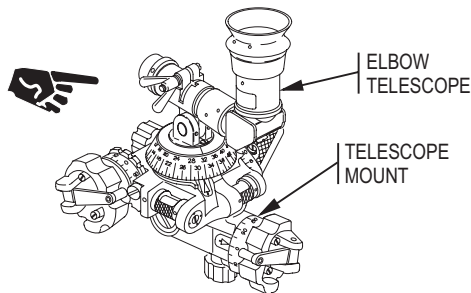


M177 MORTAR MOUNT (BIPOD). The mortar mount is an offset bipod consisting of a barrel clamp assembly which secures the bipod to the cannon, two mortar mounting buffers which reduce the shock of firing on other components, a traversing gear assembly for adjusting the mortar in azimuth, a cross-leveling mechanism for correcting weapon cant, an elevating mechanism to raise and lower the cannon, and two leg assemblies (fixed and elevating) to provide a stable base.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-Continued.



M3A1 BASEPLATE. The baseplate is made of aluminum; the socket provides a mounting point for the cannon.

**NOTE**

M67 sight unit is the primary sight unit. The M64/M64A1 sight unit may still be in use but is becoming obsolete.

M67 SIGHT UNIT. The sight unit consists of a 4.0 power hermetically sealed elbow telescope with tritium-illuminated simple cross reticle and a telescope mount with tritium-backlighted level vials, indices, and translucent plastic scales. The telescope mount includes a 6400-mil azimuth mechanism with one set of coarse and fine deflection scales. A similar mechanism is provided for elevation but is limited to travel to readings from 800 mils to 1600 mils on coarse and fine elevation scales. Identifying data are located on a nameplate attached to the telescope mount.

DIFFERENCES BETWEEN MODELS.

Some mortars may be initially fielded with the M3 Baseplate. However, the M3A1 Baseplate is the only authorized replacement.

EQUIPMENT DATA.

Physical Characteristics.

Weight:

M253 Cannon (with BAD)	35 lb (15.91 kg)
M177 Mortar Mount	27 lb (12.25 kg)
M3A1 Baseplate	29.00 lb (11.56 kg)
M67 Sight Unit	2.90 lb (1.32 kg)

Dimensions:

Overall length (without BAD)	4 ft 2 in. (1.27 m)
Overall length (with BAD)	4 ft 7 in. (1.40 m)
Diameter of baseplate	1 ft 10 in. (0.56 m)

Elevation:

Elevation (approx)	800 to 1515 mils
Per turn of elevation handwheel (approx).....	10 mils

Deflection:

- Right or left from center (approx) 100 mils
- Total deflection by movement of mortar
mount without moving baseplate 6400 mils (360 degs)
- Per turn of traversing handwheel (approx)..... 7 mils

Performance;

- Maximum range..... 5608 m (6075 yds)
- Minimum range..... 83 m (91 yds)

Change 4 1-8.1/(1-8.2 blank)



Rate of Fire:

M362 SERIES, M821, M889, M819, AND M853 CARTRIDGES

Sustained 15 rounds/min

Maximum30 rounds/min for 2 minutes

M374, M374A1, M374A2, M375, M375A1, M375A2, AND M301 SERIES
(EXCEPT M374A3 AND M375A3)

Sustained 8 rounds/min

Maximum25 rounds/min for 2 minutes

M374A3 AND M375A3 CARTRIDGES

Sustained 15 rounds/min

Maximum30 rounds/min for 2 minutes

M67 Sight Unit:

Field of view 10 degrees

Height 8.5 in. (21.6 cm)

Length 4.38 in. (11.11 cm)

Magnification 4.0 X nominal

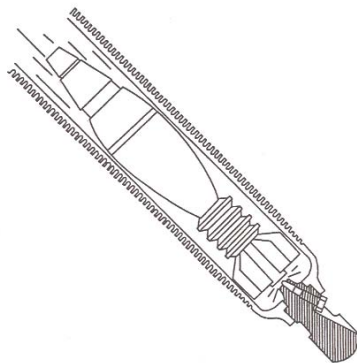
3.5 effective

Illumination source self-contained radioactive
tritium, 6 to 8 years life

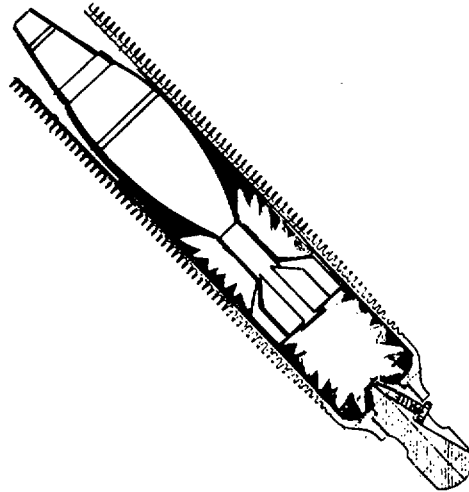
Section III. TECHNICAL PRINCIPLES OF OPERATION



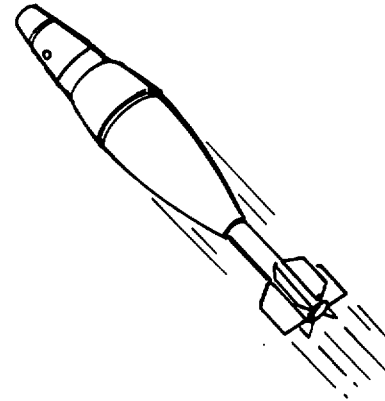
1. Mortar is fired by loading the cartridge into the barrel, fin-end first.



2. Cartridge slides down the barrel under its own weight and strikes the firing pin at the bottom.



- 3 The primer/ignition cartridge functions. The propelling charge is ignited by the ignition cartridge. Expanding gases force the cartridge up and out of the barrel.



- 4 Cartridge travels down range. Fins provide stability in flight until impact with ground/target.

CHAPTER 2

OPERATING INSTRUCTIONS

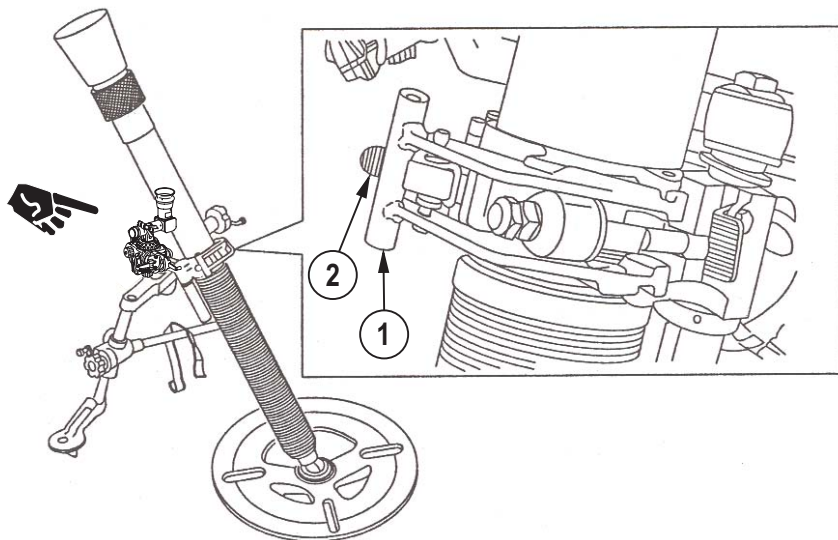
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

MORTAR.

BARREL CLAMP HANDLE. The barrel clamp handle (1) locks the two halves of the barrel clamp assembly together.

BARREL CLAMP LOCKING LEVER. The barrel clamp locking lever (2) prevents the barrel clamp handle (1) from bouncing loose during firing. Press down to release.

BARREL CLAMP LATCH. The barrel clamp latch (3) prevents the complete release of the barrel clamp assembly should the barrel clamp locking lever (2) fail and the barrel clamp handle (1) bounce loose. Turn clockwise to release.



MORTAR - Continued.

TRAVERSING HANDWHEEL. Turning the traversing handwheel (4) clockwise traverses the mortar to the right.

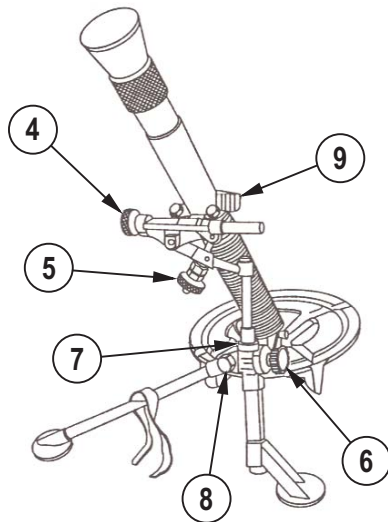
CROSS-LEVELING HANDWHEEL. Turning the cross-leveling handwheel (5) clockwise causes the left side of the mortar to move downward.

ELEVATING HANDWHEEL. Turning the elevating leg handwheel (6) clockwise depresses the mortar.

LEG LOCKING LEVER. The leg locking lever (7) positions the fixed leg assembly for emplacement on level ground. Push to release.

LEG LOCKING KNOB. The leg locking knob (8) is used to lock the fixed leg assembly in any desired position. Turn counterclockwise to release.

SIGHT UNIT ADAPTER. The sight unit adapter (9) is attached to the sight socket on the traversing gear assembly. It is used to attach the M67 sight unit.



SIGHT UNIT M67

NOTE

M67 sight unit is the primary sight unit. The M64/M64A1 sight unit may still be in use but is becoming obsolete.

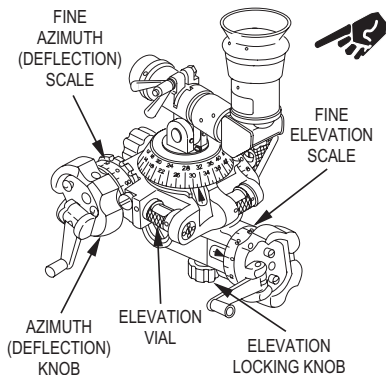
FINE AZIMUTH (DEFLECTION) SCALE. Indicates from 0 to 100 mils in 1 mil increments.

FINE ELEVATION SCALE. Indicates from 0 to 100 mils in 1 mil increments.

ELEVATION LOCKING KNOB.
Unlocks or locks elevation mechanism and scales.

ELEVATION VIAL. Indicates level condition of sight unit.

AZIMUTH (DEFLECTION) KNOB.
Rotates deflection mechanism and scales.



LATCHING LEVER. Locks the sight unit to the mortar.

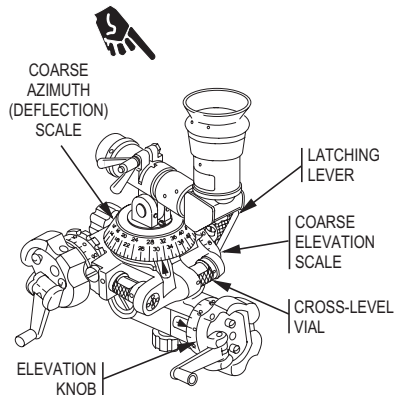
COARSE ELEVATION SCALE.

Indicates from 700 to 1600 mils in 100 mil increments.

CROSS-LEVEL VIAL. Indicates level condition of sight unit.

ELEVATION KNOB. Rotates elevation mechanism and scale.

COARSE AZIMUTH (DEFLECTION) SCALE. Indicates from 0 to 6400 mils in 100 mil increments.

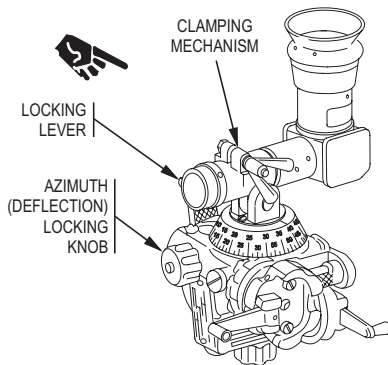


SIGHT UNIT M67 - Continued.

LOCKING LEVER. Locks clamping mechanism in upright position.

CLAMPING MECHANISM. Used to adjust and hold elbow telescope.

AZIMUTH (DEFLECTION) LOCKING KNOB. Unlocks or locks deflection mechanism and scales.



Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

The operator must perform scheduled services to be sure the 81-mm mortar will operate properly. Always keep in mind the WARNINGS and CAUTIONS before, during, and after operation. If your equipment fails to operate, troubleshoot and report any deficiencies using the proper forms. See DA PAM 750-8.

Column "B" in the PMCS table is before operations checks. Columns "D" and "A" are DURING and AFTER operations checks. When recording results of PMCS, entries in the PMCS Item No. column will be used for the TM Item No. column on DA Form 2404.

The "Equipment Is NOT READY/AVAILABLE IF" column indicates deficiencies which must be corrected before you can operate the 81-mm mortar.

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES
B = Before Operation D = During Operation A = After Operation

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
1				DA FORM 2408-4. a. Borescope every 100 rounds when firing subcaliber training rounds (M1 Sabot). <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">Weapon has not been borescoped every 100 rounds when firing subcaliber training rounds (M1 Sabot).</div> b. Check to see if your weapon has been borescoped and pullover gaged within 180 days prior to firing and within 180 day intervals during firing periods. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">Weapon has not been borescoped and pullover gaged 180 days prior to firing and within 180 day intervals during firing period.</div>	<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; top: 0; right: 0; width: 20px; height: 20px; border: 1px solid black; border-radius: 50%;"></div> <div style="position: absolute; bottom: 0; right: 0; width: 20px; height: 20px; border: 1px solid black; border-radius: 50%;"></div> </div>

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation D = During Operation A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
		<ul style="list-style-type: none">		<div>c. Update DA Form 2408-4 to reflect day's firing. After 5000 rounds fired, have weapon borescoped every 500 additional rounds. USMC users shall update NAVMC 10558A.</div> <div>After 5,000 rounds fired, weapon has not been borescoped every 500 additional rounds.</div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

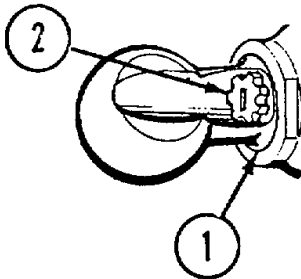
B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
2				<p>CANNON.</p> <p>WARNING</p> <p>The exterior surface of the cannon between the upper and lower stop bands must be wiped free of lubrication prior to firing. If this portion is not dry, the barrel clamp assembly will move on the barrel during firing.</p> <p>NOTE</p> <p>Cannon bore is required to be dry swab cleaned at the end of each fire mission or 10 rounds fired (approx.).</p> <ul style="list-style-type: none">a. Check for foreign matter in barrel and wipe interior of barrel dry. Also wipe exterior surface free of all lubrication.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation				D = During Operation				A = After Operation			
Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:						
	B	D	A								
				<div><div></div><div>b. Check for cracks, broken welds, rust, loose, missing, dented, or damaged parts on cannon and blast attenuator device.</div><div>Cannon (including cooling fins) or blast attenuator device has cracks, broken welds, loose, missing, dented, or damaged parts.</div></div>	←						
				<div><div></div><div>c. Breech plug (1) must not be loose.</div><div>Breech plug is loose.</div></div>							
			<div><div></div><div>d. Check for bulges, dents, and visible cracks. Check for evidence of gas leakage around firing pin (2) or breech plug (1) (visible discoloration).</div><div>Barrel is bulged, dented, or visibly cracked, or shows evidence of gas leakage around firing pin or breech plug (visible discoloration).</div></div>	←							

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
3				CANNON-Continued. <ul style="list-style-type: none">e. Use RBC (item 6, app D) to thoroughly clean barrel bore after firing and two consecutive days thereafter. See page 3-4.f. Check straightness of bore prior to each firing session. (for USMC ONLY) <p>NOTE For nonfiring periods, barrel is cleaned and lubricated on a weekly basis.</p> BIPOD. <ul style="list-style-type: none">a. Check bipod (including fixed leg assembly) for cracks, broken welds, rust, and loose, missing, or damaged parts.	
				<div>Bipod has cracks, broken welds, loose, missing, or damaged parts.</div>	

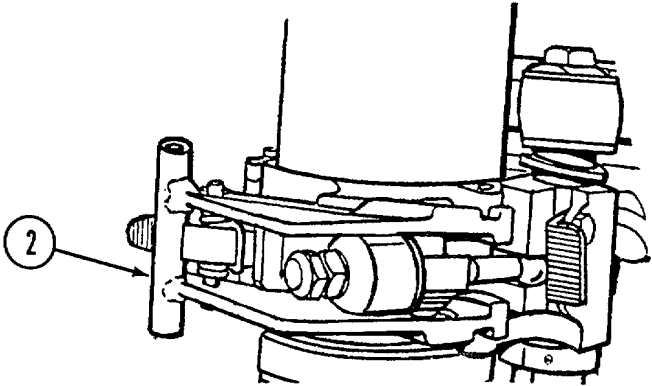
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
	<ul style="list-style-type: none">			<p>b. Check that barrel clamp assembly (2) operates properly and holds cannon securely.</p> <div>Barrel clamp assembly is inoperative if it doesn't hold cannon securely.</div>	



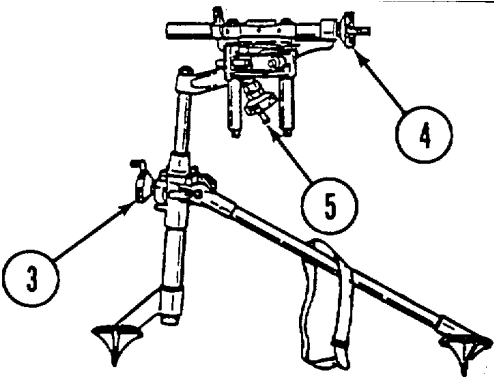
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
				<p>BIPOD-Continued.</p> <p>c. Elevating leg assembly (3), traversing gear assembly (4), and cross-leveling mechanism (5) must operate smoothly and without binding through entire range of travel.</p> <div><p>Elevating leg assembly, traversing gear assembly, or cross-leveling mechanism is binding or inoperative.</p></div>	



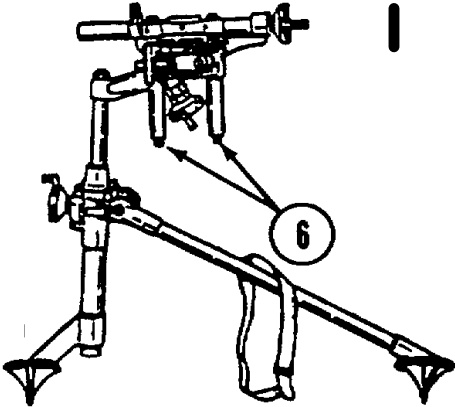
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
			<ul style="list-style-type: none">d. Fully extend bipod assemblies to clean and lubricate exposed bearing surfaces with general purpose lubricating oil (item 12, app D).e. Test function the mortar mounting buffers (6) by pulling down on both of them at the same time; they should return to the original position when released.		
				Mortar mounting buffers are binding or inoperative. ←	

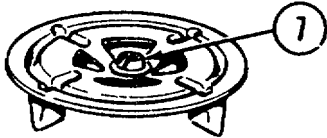


OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation


Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
4				BASEPLATE. <ul style="list-style-type: none">• a. Rotate U-shaped socket (7) 360 degrees.• b. Check baseplate for cracks, broken welds, loose, missing, or damaged parts.	
				<div>Socket does not rotate 360 degrees. Baseplate has cracks, broken welds, missing, or damaged parts.</div> 	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

B = Before Operation

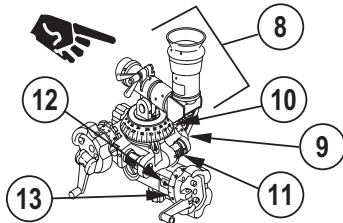
D = During Operation

A = After Operation

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
5				<p>M67 SIGHT UNIT.</p> <p>WARNING</p> <p>RADIATION HAZARD</p>  <p>TRITIUM (H₃)</p> <p>Radioactive contamination may occur if vials containing tritium gas are broken. If breakage occurs or if illumination is not present, notify the local radiological protection officer or chemical biological radiological (CBR) officer. See warning summary for instructions on evacuation of the item to a depot maintenance activity.</p> <p>NOTE</p> <p>M67 sight unit is the primary sight unit. The M64/M64A1 sight unit may still be in use but is becoming obsolete. PMCS procedures are similar.</p>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.**B = Before Operation****D = During Operation****A = After Operation**

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
5	•		•	<p>a. There are ten items on the sight unit that are radioactively illuminated. Check the ten items listed below in a darkened area. If they are damaged or not illuminated, notify the RPO. See warning summary for detailed procedures.</p> <p>8. Telescope 9. Coarse elevation scale 10. Coarse elevation index arrow 11. Cross-level vial 12. Fine elevation index arrow 13. Fine elevation scale</p>	

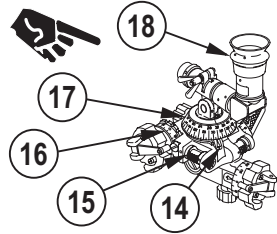


OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

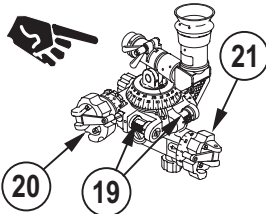
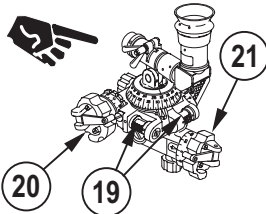
B = Before Operation

D = During Operation

A = After Operation

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
5				M67 SIGHT UNIT - Continued. 14. Coarse deflection index arrow 15. Elevation vial 16. Fine deflection scale 17. Coarse deflection scale	 <div> <p>Items are damaged or not illuminated. ←</p> <p>b. Check eyeshield (18) for damage. Check lenses and windows for smears, scratches, cracks, or other obstructions.</p> <p>Image is totally obstructed. ←</p> </div>

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.**B = Before Operation****D = During Operation****A = After Operation**

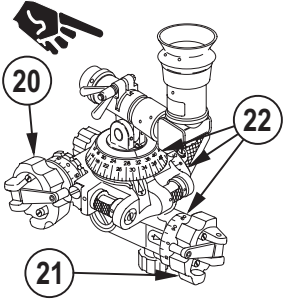
Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
	•			<p>c. Level vials (19) must not be cracked, broken, or loose.</p> <div> <div>Level vials are cracked, broken, or loose.</div>  </div>	
	•			<p>d. Check the azimuth and elevation control knobs (20 and 21) for free and easy operation through entire range.</p> <div> <div>Knobs do not turn.</div>  </div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

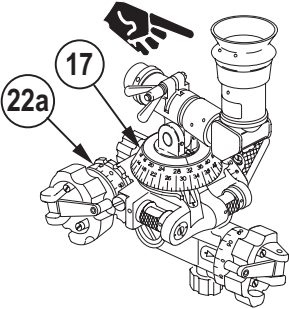
B = Before Operation

D = During Operation

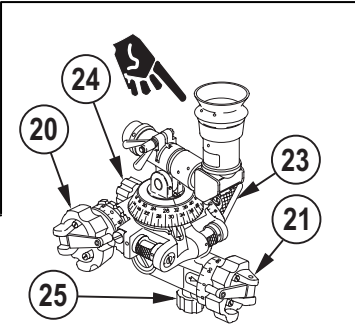
A = After Operation

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
5	•			M67 SIGHT UNIT - Continued. e. Check backlash of azimuth and elevation control knobs (20 and 21). It must not exceed 0.5 of a mil. <div>Backlash exceeds 0.5 mil.</div>	
				f. Check index scales and lines (22). They must be clear and distinct. <div>Scales and indexes cannot be read.</div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.**B = Before Operation****D = During Operation****A = After Operation**

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
		•		f.1. Check coarse deflection scale (17) to ensure that scale rotates freely when depressed and returns to a locked position under spring tension when released.	
		•		g.1. Check azimuth dial scale (22a) to ensure that scale rotates freely when depressed and returns to a locked position under spring tension when released.	
				<div style="border: 1px solid black; padding: 5px; width: fit-content;">Dial scale slips during firing.</div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.**B = Before Operation****D = During Operation****A = After Operation**

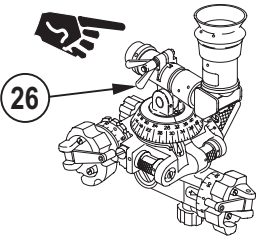
Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
	•			<p>g. Check dovetail latching lever (23) for cracks. Also check that locking lever secures sight unit to adapter and that the mounting surface is free from nicks and burrs.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Locking lever broken or does not secure sight unit; nicks and burrs prevent proper seating of sight unit.</p> </div>	
	•			<p>h. Check that azimuth and elevation control knobs (20 and 21) stay in position when locking knobs (24 and 25) are tightened.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Azimuth or elevation control knob slips when locking knobs are tightened.</p> </div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

B = Before Operation

D = During Operation

A = After Operation

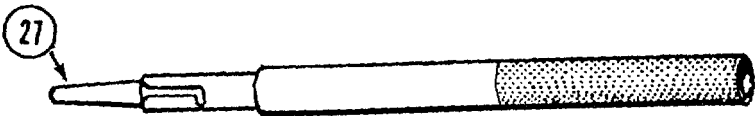
Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
5	•			M67 SIGHT UNIT - Continued. <p>i. Check that clamping mechanism (26) secures elbow telescope to telescope mount.</p> <div> <div>Clamping mechanism does not secure elbow telescope.</div>  </div>	
				<p>j. Check M67 sight unit for missing or damaged radiation warning, data plate, or other parts.</p> <div> <div>Missing or has damaged radiation warning, data plate, or other parts.</div> </div>	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.**B = Before Operation****D = During Operation****A = After Operation**

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
			•	k. Wipe sight unit with clean dry cloth (item 15, App D) before storing in carrying case.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation D = During Operation A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
6				M14 AIMING POSTS AND COVER.	
	•			a. Check for completeness and that mating surfaces are clean, free of paint and fit properly.	
				<div>Mating surfaces do not fit properly.</div> ←	
	•			b. Check that posts (27) are not bent or broken.	
				<div>Posts are bent or broken.</div> ←	
					

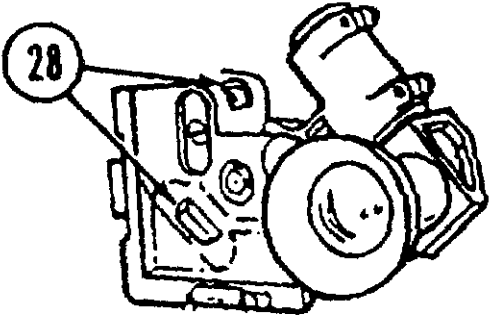
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Continued.

B = Before Operation

D = During Operation

A = After Operation

Item no.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
7				<p>M45A1 BORESIGHT.</p> <p>NOTE</p> <p>See FM 23-90 Mortars, for alternate method of boresighting.</p> <ul style="list-style-type: none">a. Check eyeshield for damage. Check lenses and windows for smears, scratches, cracks, or other obstructions. <div>Target image is obstructed.</div> <ul style="list-style-type: none">b. Level vials (28) must not be cracks broken, or loose in mounting.	


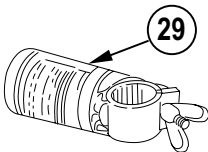


OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

B = Before Operation

D = During Operation

A = After Operation

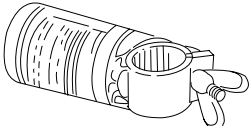
Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF:
	B	D	A		
8				<p>M58 AND M59 AIMING POST LIGHTS.</p> <p style="text-align: center;">WARNING</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>RADIATION HAZARD</p>  </div> <div style="text-align: center;"> <p>TRITIUM (H₃)</p> </div> </div> <p>Radioactive contamination may occur if vials containing tritium gas are broken. If breakage occurs or if illumination is not present, notify the local radiological protection officer or chemical biological radiological (CBR) officer. See inside front cover for instructions on evacuation of the item to a depot maintenance activity.</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>•</p> <p>•</p> </div> <div> <p>a. Check aiming post lights (29) for proper illumination in a darkened area. If they are damaged or not illuminated, notify the RPO. See inside front cover for detailed procedures.</p> </div> </div> <div style="text-align: right; margin-top: 20px;">  </div>	

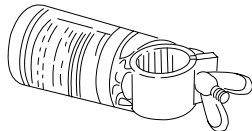
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued.

B = Before Operation

D = During Operation

A = After Operation

Item No.	Interval			ITEM TO BE INSPECTED Procedure	Equipment is NOT READY/AVAILABLE IF: _____
	B	D	A		
8				M58 AND M59 AIMING POST LIGHTS - Continued	
				<div>Items are damaged or not illuminated.</div>	←
	•			b. Check M58/M59 aiming post lights for missing or damaged radiation warning, data plate, or other parts.	
				<div>Missing, or has damaged radiation warning, data plate, or other parts.</div>	←
	•			c. Check for evidence of tampering (aiming post lights are factory sealed and no disassembly is authorized or required).	
				<div>Evidence of tampering.</div>	←
			•	d. Wipe aiming post lights with clean dry cloth (item 15, app D) before storing.	



Section III. OPERATION UNDER USUAL CONDITIONS

ASSEMBLY AND PREPARATION FOR FIRING-EMPLACEMENT OF MORTAR.

WARNING

Firing site must have enough mask clearance and no overhead obstructions.

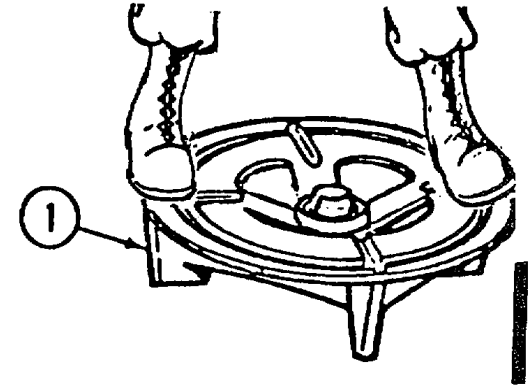
1. Select a firm, level site for emplacing mortar.
2. Prepare a horizontal surface upon which to place baseplate and bipod leg assemblies.
3. Place baseplate (1) on prepared site.

NOTE

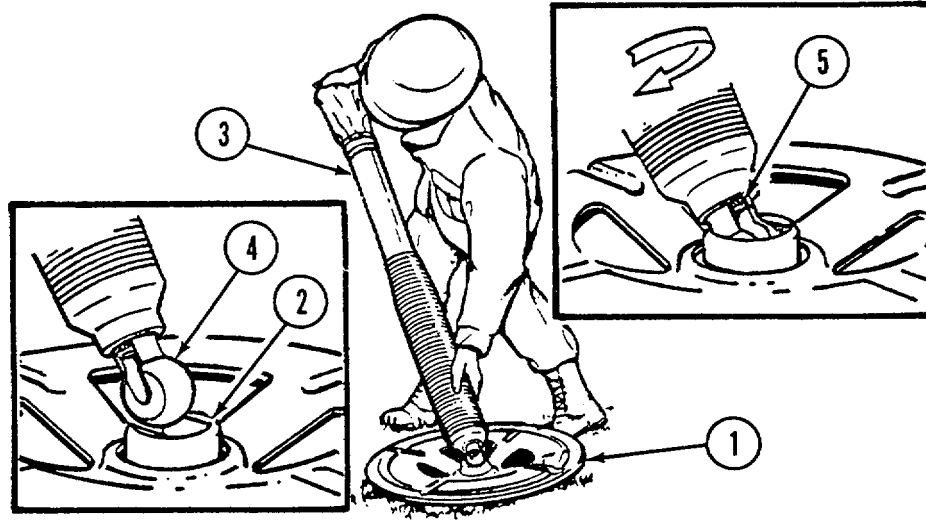
Due to difference in terrain, initial seating of baseplate may include digging out area around legs before jumping on baseplate.

4. Set baseplate (1) firmly in place by jumping on it.

All data on 2-30 deleted

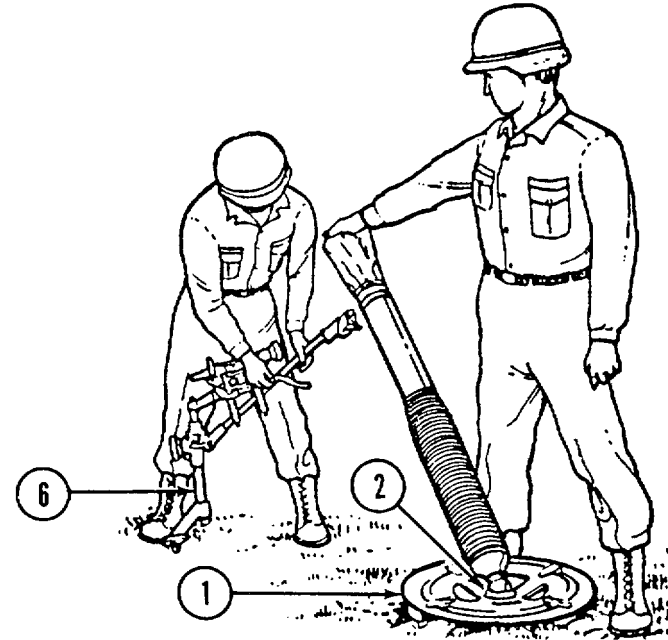


7. Lower cannon (3) onto baseplate (1) so that vertical faces of breech plug (4) fit into cutaway portion of baseplate socket (2).
8. Rotate cannon (3) 1/4 turn to lock it into baseplate (1). The firing pin (5) must be up and clearly visible.



ASSEMBLY AND PREPARATION FOR FIRING-EMPLACEMENT OF MORTAR-Continued.

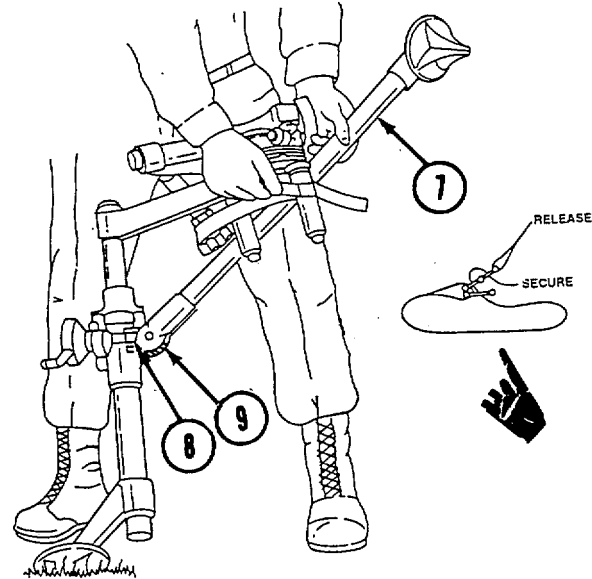
9. The assistant gunner standing in front of baseplate (1), with back to line of fire, places foot of elevating leg assembly (6) about 26 inches in front of and 16 inches to the right of baseplate (2).



NOTE

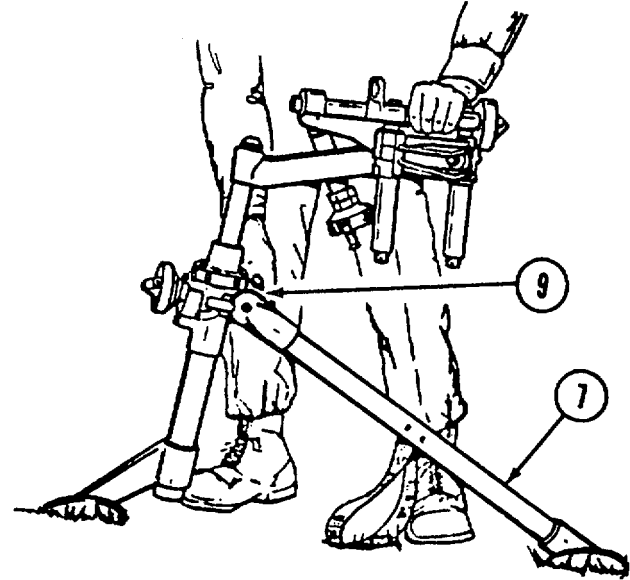
On level ground, the correct position for the fixed leg assembly (7) is where the leg locking lever (8) engages. On uneven ground, the correct position is reached when the elevating leg assembly is leaning about 5 to 10 degrees toward the centerline of the mortar.

10. Unstrap fixed leg assembly (7), loosen leg locking knob (9), and lower fixed leg assembly (7) to the ground. Leg strap must remain properly laced through buckle to allow utilization of quick release/fasten design.

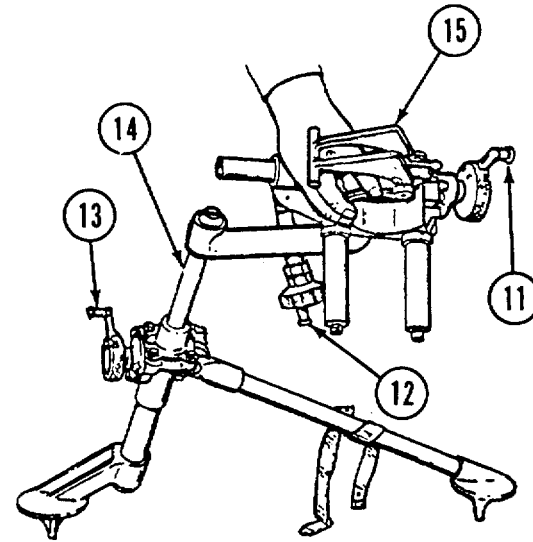


ASSEMBLY AND PREPARATION FOR FIRING - EMPLACEMENT OF MORTAR - Continued.

11. Lock fixed leg assembly (7) in place by tightening leg locking knob (9).

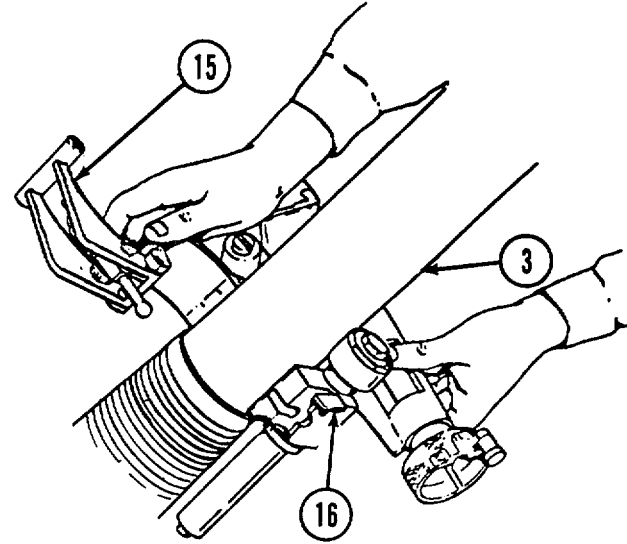


12. Unfold traversing handwheel (11), cross-leveling handwheel (12), and elevating handwheel (13).
13. Turn elevating handwheel (13) until about 8 inches of elevating shaft (14) are exposed. Center barrel clamp assembly (15) by using traversing handwheel (11).

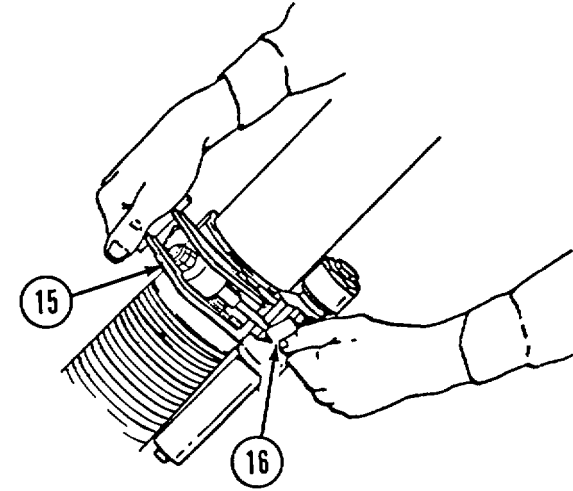


ASSEMBLY AND PREPARATION FOR FIRING-EMPLACEMENT OF MORTAR-Continued.

14. Release barrel clamp latch (16), open barrel clamp assembly (15) and clamp to cannon (3).



15. Adjust bipod until barrel clamp assembly (15) rests against lower stop band of cannon. Lock barrel clamp assembly, and apply barrel clamp latch (16).

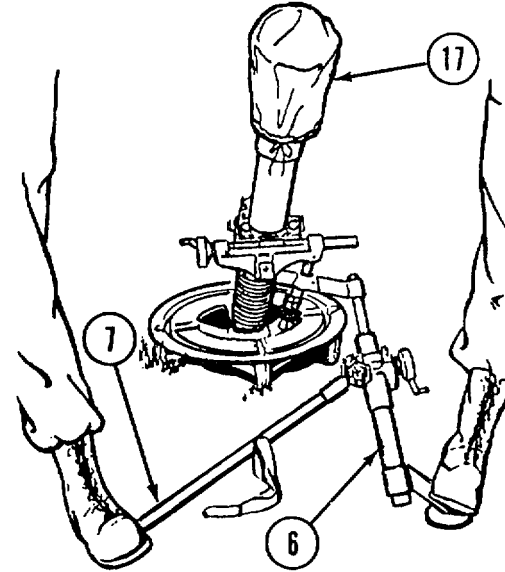


ASSEMBLY AND PREPARATION FOR FIRING-EMPLACEMENT OF MORTAR-Continued.

16. Firmly seat legs of fixed leg assembly (17) and elevating leg assembly (6).

NOTE

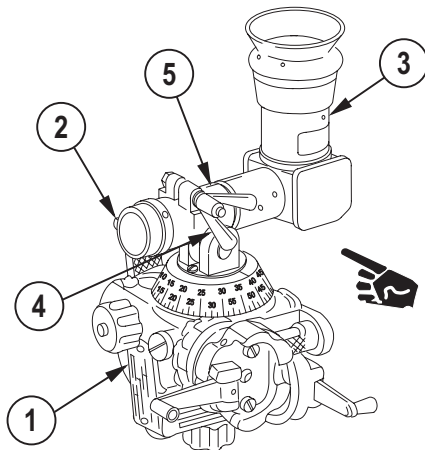
Do not remove muzzle cover (17) at this time.



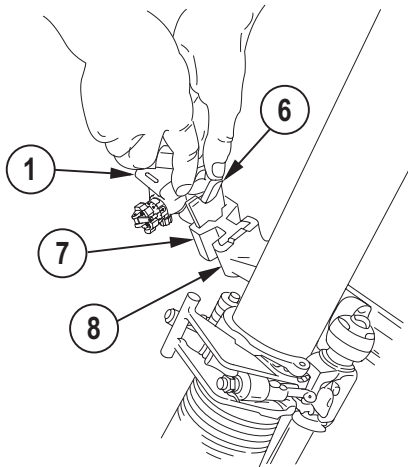
ASSEMBLY AND PREPARATION FOR FIRING - INSTALLATION OF M67 SIGHT UNIT.

1. Remove sight unit (1) from carrying case.
2. Pull clamping mechanism (2) up and raise elbow telescope (3) to vertical position as shown. Push clamping mechanism (2) down to lock.
3. Loosen wing nut (4) and align top index line (5) with line on the telescope. Tighten wing nut (4).

All data on 2-39 deleted.

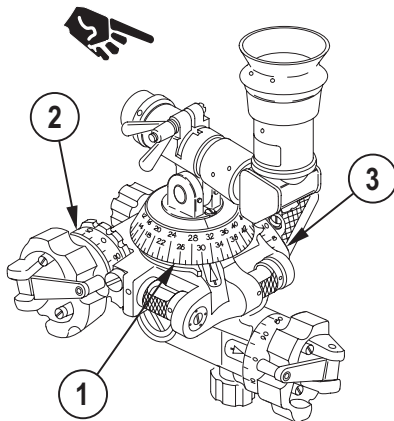


4. Press latching lever (6) while installing sight unit (1) to sight unit adapter (7) on bipod (8). Release latching lever, and check to see that latching lever has firmly locked sight unit to bipod sight unit adapter.



ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT.

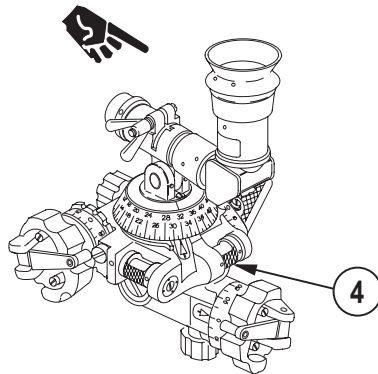
1. Check that elevation and traversing mechanisms are approximately centered.
2. Make a visual check that the elbow telescope is roughly parallel to the ground.
3. If coarse deflection scale (1) is not set at 3200 mils, set it by pushing down around the circumference of the coarse deflection scale (1), turning it to 32, and releasing it.
4. Set fine deflection scale (2) to 0 mils.
5. Set coarse elevation scale (3) to 0800 mils.



6. Remove cant if present, by turning cross-leveling operating handle until bubble in cross-level vial (4) on sight unit is centered.

NOTE

Do not use deflection knob on the sight unit to remove cant.

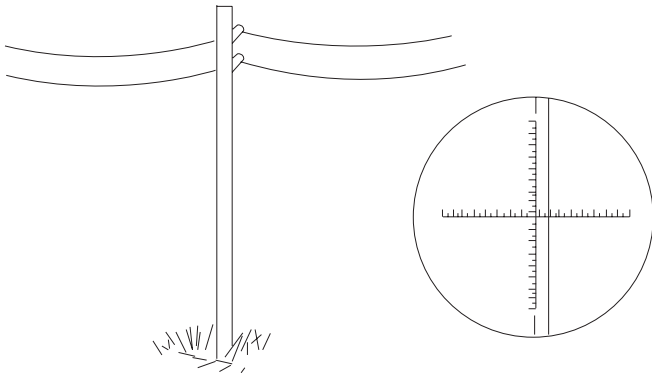


ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

7. Select an aiming point that has a clearly defined vertical line. The aiming point should be as far away as possible and not less than 200 meters.

NOTE

Always sight along left edge of aiming point.



8. Look through the elbow telescope and pick out the distant aiming point. Move mortar if necessary to place the cross hairs on the distant aiming point. Do not use the traversing mechanism, but physically pick up the mortar to align it on the aiming point.
9. Check both level bubbles and adjust if necessary using mortar controls only. You are now ready to boresight.

NOTE

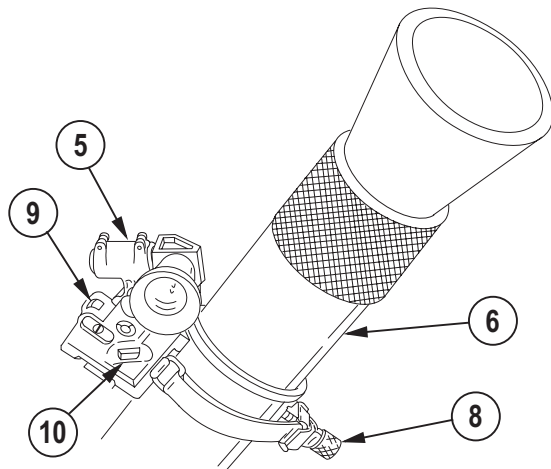
It is important to have the mortar cannon in the center of traverse at this time.

ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

10. Remove M45A1 Boresight (5) from carrying case and place on top of cannon (6) just below upper step band.

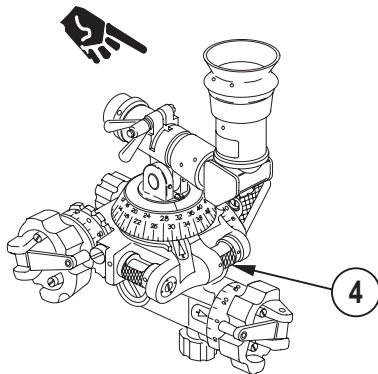
NOTE

- The elbow telescope on the boresight is not used to set the cannon to 800 mils so its orientation is not important.
 - Slight movements of boresight may be made by loosening clamp screw (8) and lightly tapping boresight body.
11. Center bubble in boresight cross-level vial (9) by rotating boresight (5) slightly around cannon (6) and tightening clamp screw (8).
 12. Elevate or depress cannon until bubble in boresight elevation level vial (10) is centered.

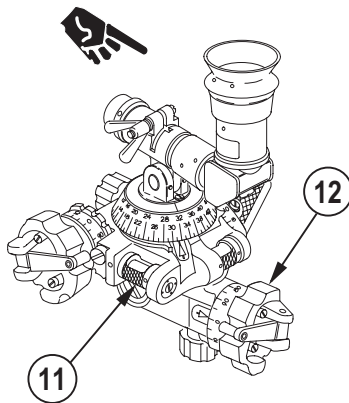


ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

13. Check the cross-level vial (4) on the sight unit. Center bubble if necessary and do not disturb the cross-level on the boresight. You may have to go back and forth on these two units to get them both centered.
14. Repeat above steps until the bubbles in the cross-level vial of the sight unit, the cross-level vial of the boresight, and the elevation level vial of the boresight are centered.
15. The tube is now at 800 mils elevation.



16. Check that bubble in elevation vial (11) of sight unit is centered. If it is not, adjust elevation control knob (12) until it is.
17. Check cross-level vials on the sight unit and the boresight to make sure bubbles are still centered. Adjust until the bubbles are centered.
18. Check elevation vial on the boresight to make sure that bubble is still centered.
19. Repeat previous steps until all four bubbles are centered.

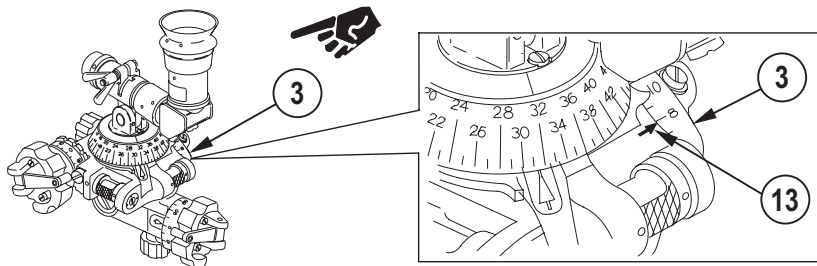


ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

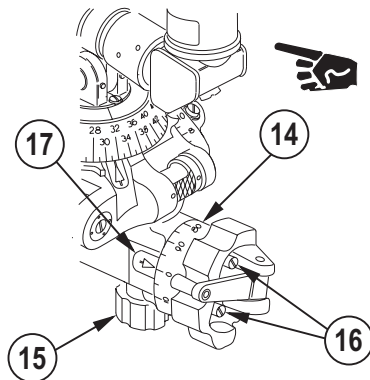
CAUTION

Do not tamper with the coarse elevation scale. This could cause damage to the scale or the sight unit.

20. The reading on coarse elevation scale (3) should be 800 mils. (The coarse elevation index arrow (13) should point to 8 on coarse elevation scale.) A mismatch of ± 20 mils is acceptable. If over 20 mils off, remove and turn in the sight unit for corrective maintenance.



21. The reading on fine elevation scale (14) should be 0 mils. If it isn't, tighten elevation locking knob (15), loosen two screws (16), and slip scale until arrow (17) points to 0 mils. Tighten screws (16) and loosen elevation locking knob (15).
22. Recheck all level bubbles and adjust as necessary.
23. The mortar is now boresighted for elevation.



**ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT -
Continued.**

NOTE

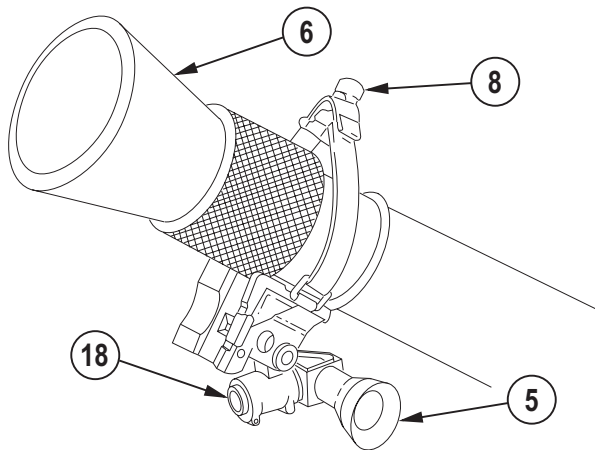
As an alternate method of boresighting the following procedures may be performed without removing boresight from atop cannon and with both telescopes facing backwards.

24. Carefully remove the boresight (5) from the top of cannon (6). Change strap to other V-block surface and mount to underside of cannon with the boresight elbow telescope (18) facing forward.

NOTE

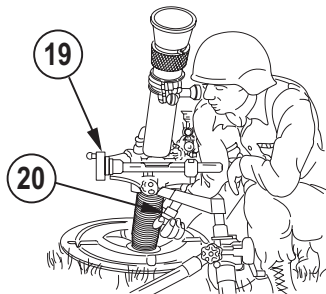
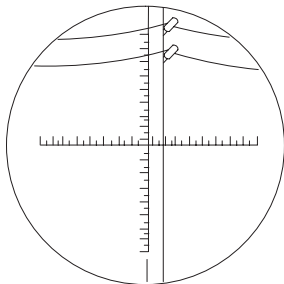
Slight movements of boresight may be made by loosening clamp screw (8) and lightly tapping boresight body.

25. Center the cross-level vial by rotating the boresight slightly. When the bubble centers, tighten the clamp screw (8).
26. Recheck all level bubbles and adjust as necessary.

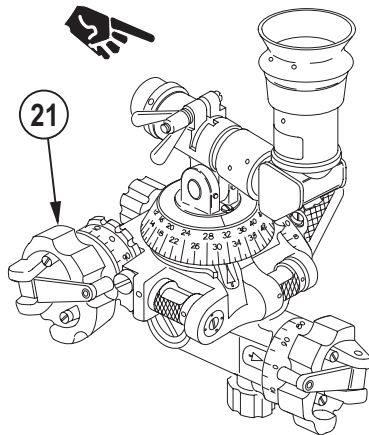


ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

27. Look through the boresight elbow telescope and find the distant aiming point. Move cross hairs to vertical side of distant aiming point by moving traversing handwheel (19) no more than two turns in either direction from center.
28. Re-level the cross-level vials on the boresight and the sight unit by using the cross-leveling handwheel (20). This step may have to be repeated several times until both boresight and sight unit are cross-leveled.

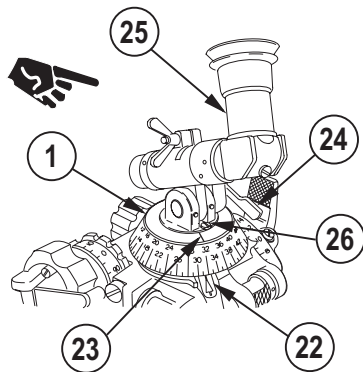


29. Look through the sight unit and find the distant aiming point. Move cross hairs to show exactly the same vertical side of distant aiming point as is shown in the boresight. Do this by turning the azimuth control knob (21) on the sight unit.
30. Recheck all level bubbles and adjust as necessary.
31. When both elbow telescopes show the proper target patterns, proceed with the next step.

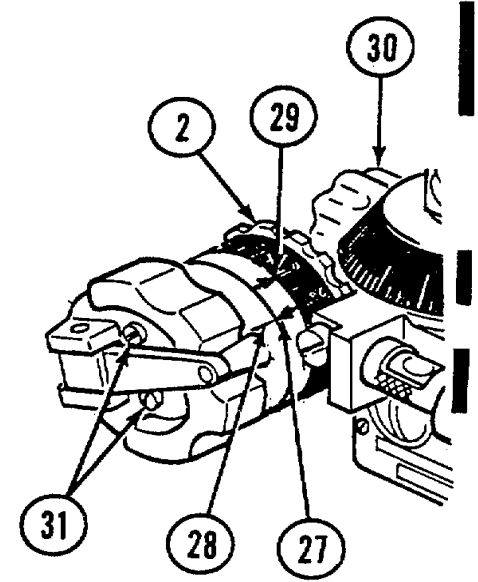


ASSEMBLY AND PREPARATION FOR FIRING - BORESIGHTING WITH M67 SIGHT UNIT - Continued.

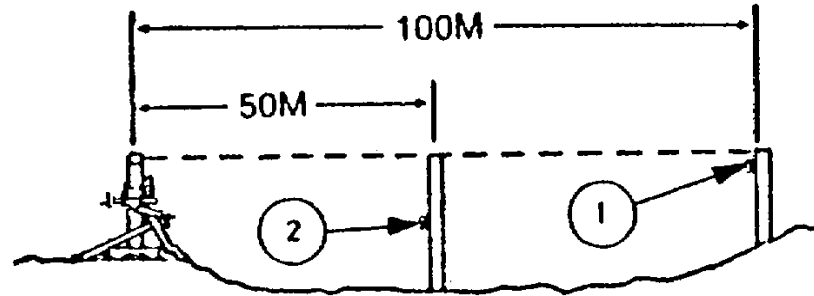
32. The 32 on coarse deflection scale (1) and arrow (22) should line up (3200 mils). If not, push down on the circumference of the scale, turn it to 32, and release it.
33. Line on pointer dial (23) should align with 32 on coarse deflection scale (1). If it does not, loosen locking lever (24), pivot elbow telescope (25) out of the way, and loosen the two screws (26) holding the inner pointer dial (23). Turn coarse deflection scale (1) until line is at 32 and then tighten screws (26).
34. Reposition elbow telescope (25) and tighten locking lever (24).



35. Fine deflection red index arrow (27) should align with red index line of control dial (28). Black index arrow (29) should align with 0 mils.
36. If they do not, tighten azimuth locking knob (30). Loosen two screws (31).
37. Turn red index line of control dial (28) to align with red index arrow (27).
38. Disengage fine deflection scale (2) and turn to align 0 mils with black index arrow (29).
39. Tighten two screws (31) and loosen azimuth locking knob (30).
40. Remove boresight from cannon and store in carrying case. Mortar is now boresighted.



OPERATING PROCEDURES-EMPLACING AIMING POSTS FOR INDIRECT FIRE.



CAUTION

If ground is hard, do not hammer on tail end of aiming posts to emplace. Use entrenching tool or rock to drive in the aiming driving stake. When stake is in firmly, connect aiming post to the point, tail down.

1. Place two sets of assembled aiming posts in ground in a line at a referred deflection from direction of fire. The far post should be emplaced first, 100 meters from weapon where possible. Emplace near post halfway between far post and weapon.

2. If required, place an aiming post light on each post. Far post light (1) should be visible above near light (2).

OPERATING PROCEDURES—ESTABLISHING ALTERNATE AIMING LINE.

NOTE

Once the aiming line is established using the aiming posts, another aiming line should be established, time permitting, in case something happens to the aiming posts.

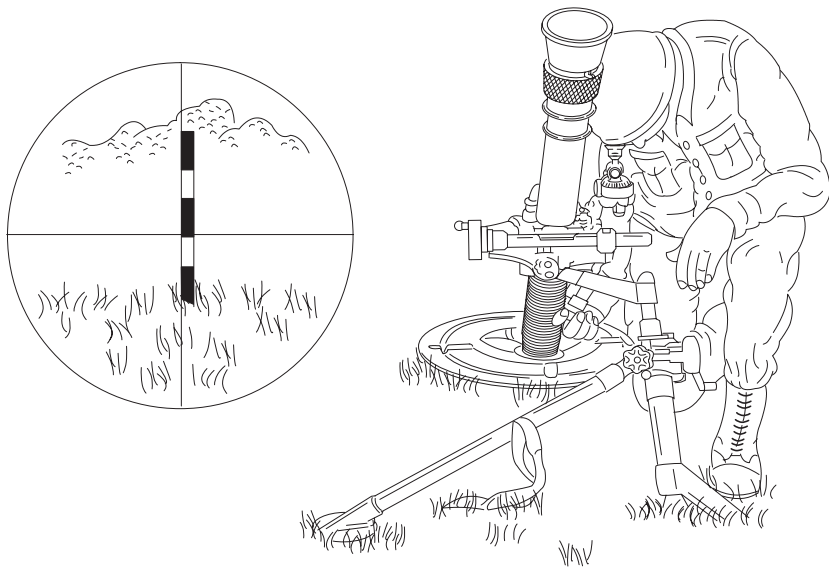
1. Sight upon a clearly defined object as close to aiming line as possible.
2. Record difference in mils between object and aiming line.
3. To use alternate aiming line, add difference in mils to deflection received from fire direction center (FDC).

OPERATING PROCEDURES—OPERATION OF M67 SIGHT UNIT.

NOTE

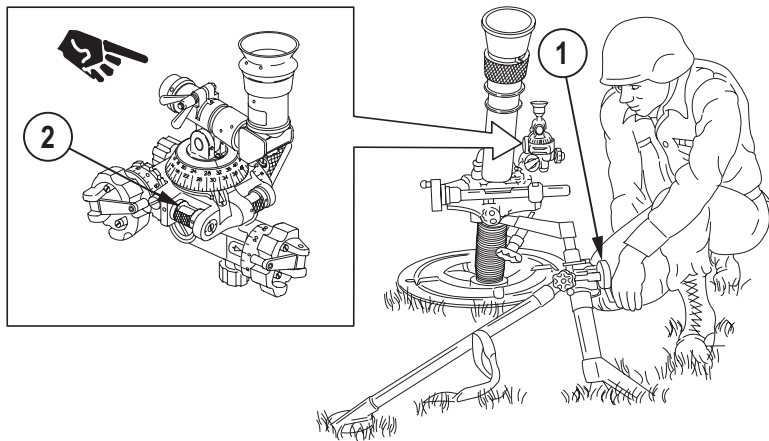
Plotting board M16 is a portable instrument used to geometrically compute the range and azimuth to target from mortar. Refer to TM 9-1220-243-12&P for more information about the plotting board.

1. Place deflection received from fire direction center (FDC) on sight unit.
2. Place deflection received from FDC on sight unit.
3. If deflection shift is greater than 75 mils, center cannon on traversing gear and move the bipod. Sight mortar on aiming posts.

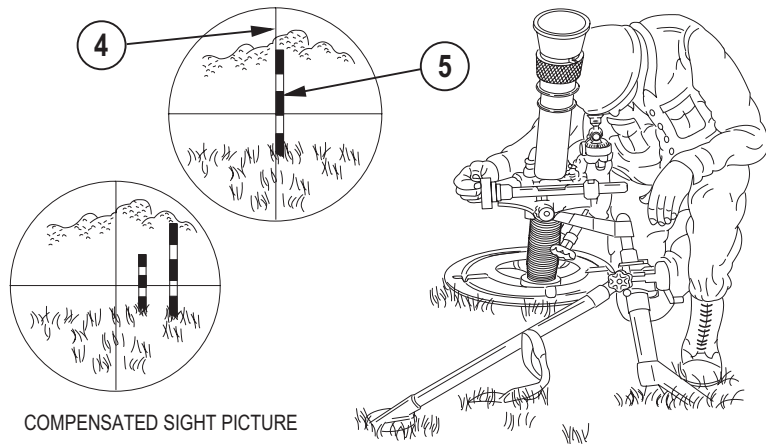


OPERATING PROCEDURES—OPERATION OF M67 SIGHT UNIT - Continued.

4. Turn elevating handwheel (1) to level bubble in elevation level vial (2).

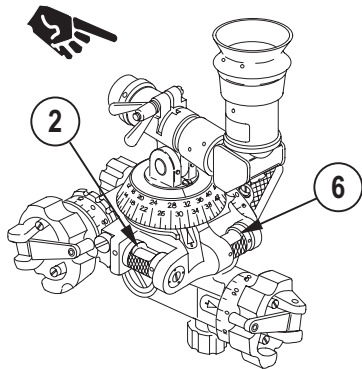


5. Look through sight unit, and turn traversing handwheel to realign vertical reticle line (4) on aiming posts (5) or to obtain a correct compensated sight picture if the deflection shift was large.



OPERATING PROCEDURES—OPERATION OF M67 SIGHT UNIT - Continued.

6. Check to ensure that sight picture is correct. If it is not, repeat adjustments until a correct sight picture is obtained with the bubbles level in both the elevation level vial (2) and the cross-level vial (6).



OPERATING PROCEDURES - LOADING AND FIRING.

WARNING

- Before settling of baseplate, it is absolutely necessary to remove sight unit.
- Upon releasing cartridge, pass hands downward and, at the same time, turn away from muzzle of mortar cannon to prescribed body and head position, to avoid blast which occurs when cartridge fires.
- Do not look into cannon, and do not try to force a cartridge down cannon.
- Weapon is not to be fired without blast attenuator device.
- Cannon bore is required to be dry swab cleaned at the end of each fire mission, or 10 rounds fired (approx.). Firing ammunition in a heavily lubricated bore can result in hangfire or failures to fire.
- Sandbag the bipod legs when firing M821 HE, M889 HE, M819 RP, M853 ilium, and M879 TP cartridges above charge 2.
- Dented barrels must be replaced as they are unsafe for firing.

Change 5 2-65

OPERATING PROCEDURES - LOADING AND FIRING - Continued.

WARNING - Continued

- In case of misfire, refer to misfire procedures on page 2-68
- Mortar crew is required to use single hearing protection during firing.
- The following prescribed head positions must be observed during all loading and firing operations:
Gunner's head should be 0.68 meters (27 in.) above the ground and 0.75 meters (30 in.) from the muzzle on a 215 degree radial from the muzzle.
Loader's head should be 0.8 meters (32 in.) above the ground and 0.95 meters (37 in.) from the muzzle on a 155 degree radial from the muzzle.
See pages g and h for illustrations.



WARNING -Continued

- All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.
- Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than seven feet could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the ASP as unserviceable.
- The mortar crew must have adequate cover for protection from fragments when firing to ranges of 400 meters or less.

WARNING - Continued

- **Double loading of mortar ammunition had resulted in catastrophic accidents. Loading a mortar weapon with two men (alternately) can be very dangerous and could prove fatal. Even with one-man loading, double loading can occur. This is especially true in rapid fire exercises. For this reason, it is imperative that there be absolute certainty that the previous round left the mortar tube before a new round is dropped in.**

CAUTION

- **Prior to firing the mortar seating round(s), the sight unit must be removed.**
 - **Following the seating round(s), the sight unit must be firmly attached.**
1. Remove muzzle cover.
 2. Hold cartridge body near center.
 3. Insert cartridge into barrel (fin end first).

OPERATING PROCEDURES - LOADING AND FIRING - Continued.

4. In order for the baseplate to provide a stable platform for firing, it must be firmly seated. This is normally achieved by standing on both sides of baseplate for the first 2 rounds under normal conditions. The barrel clamp will slide as long as the baseplate is being settled. It then should move only slightly under normal operations.
5. Release cartridge. Cartridge will slide down barrel under its own weight, strike firing pin at bottom, and fire.

NOTE

See chapter 4 for allowable number of rounds per day.

LOG BOOK ENTRIES AFTER FIRING.

1. After firing has been completed for the day, enter the rounds fired on DA Form 2408-4. USMC users shall enter the rounds fired in Weapon Record Book, NAVMC 10558A, in accordance with TM 4700-15/1.
2. No entry need be made in columns e, g, and h of DA Form 2408-4.

OPERATING PROCEDURES-MISFIRE.

NOTE

A misfire is a failure to fire after cartridge is dropped into mortar cannon. Misfires may be caused by defective ammunition, damaged firing pin, or an obstruction in bore that prevents cartridge from sliding down and striking pin.

MISFIRE.

1. If the weapon misfires, any crew member shouts "MISFIRE".
2. All personnel, except the gunner, move 50 meters from the rear of the mortar.

OPERATING PROCEDURES - MISFIRE - Continued.

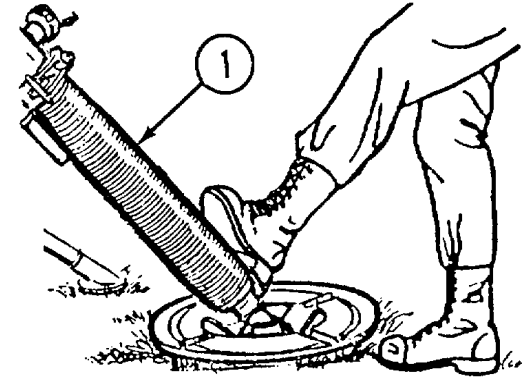
WARNING

I

If step 3 does not cause the cartridge to fire and the mortar is hot, wait until the mortar is cool enough to move with bare hands. If the mortar is cool enough at time of misfire, wait one minute before removing the cartridge. This is to avoid an accident from possible delayed action of the ignition cartridge. Water or snow applied to the outside of the barrel can be used for cooling.

Change 2 2-68.2

3. When a misfire occurs, the gunner stands behind the mortar and strikes the barrel (1) several sharp blows with the heel of his boot.
4. If the round fails to fire after he has kicked the barrel, the gunner moves to where the rest of the crew is and waits for one minute.
5. If cartridge fires, the mortar is re-laid and firing is continued after swabbing the bore to remove any debris that may have caused the misfire.
6. If cartridge does not fire, see Cartridge Removal Procedures on following page.



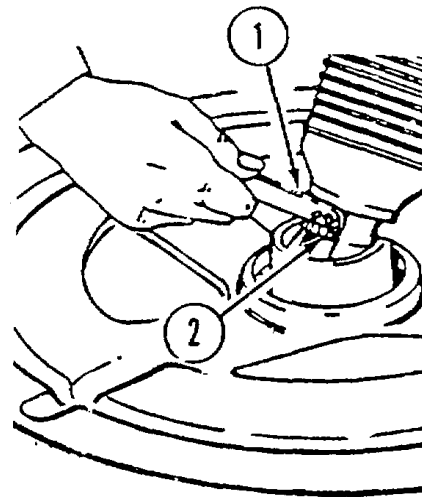
OPERATING PROCEDURES-MISFIRE-Continued.**CARTRIDGE REMOVAL PROCEDURES.**

1. The gunner checks the barrel for heat with his fingertips and announces when the barrel is cool enough to begin cartridge removal procedures.

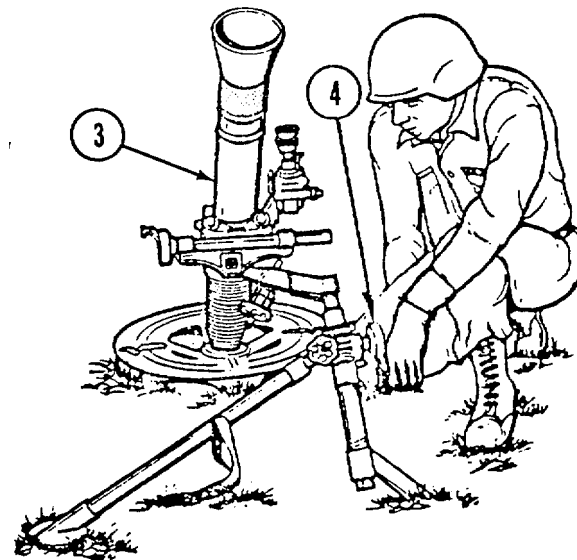
CAUTION

Sight unit must be removed before continuing.

2. Lock sight unit knobs on last deflection and place in carrying case.
3. The gunner, using firing pin wrench (1), should then remove the firing pin (2) completely.



4. If firing pin cannot be removed, the gunner depresses the cannon (3) to its lowest elevation by turning the elevation handwheel (4).



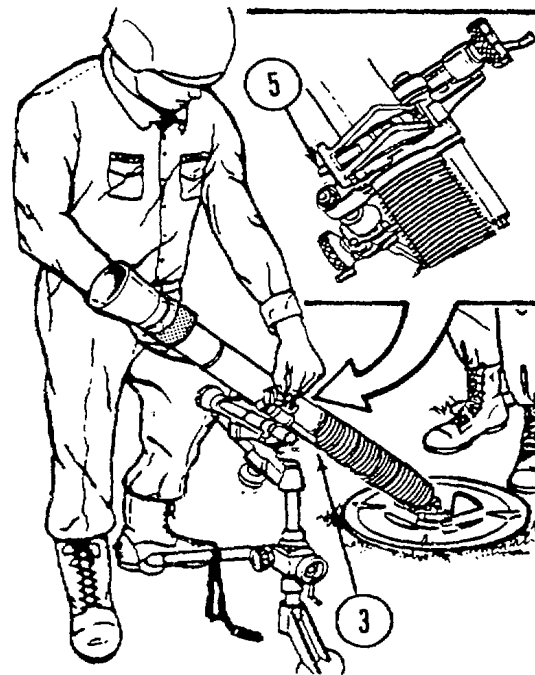
OPERATING PROCEDURES-MISFIRE-Continued.

WARNING

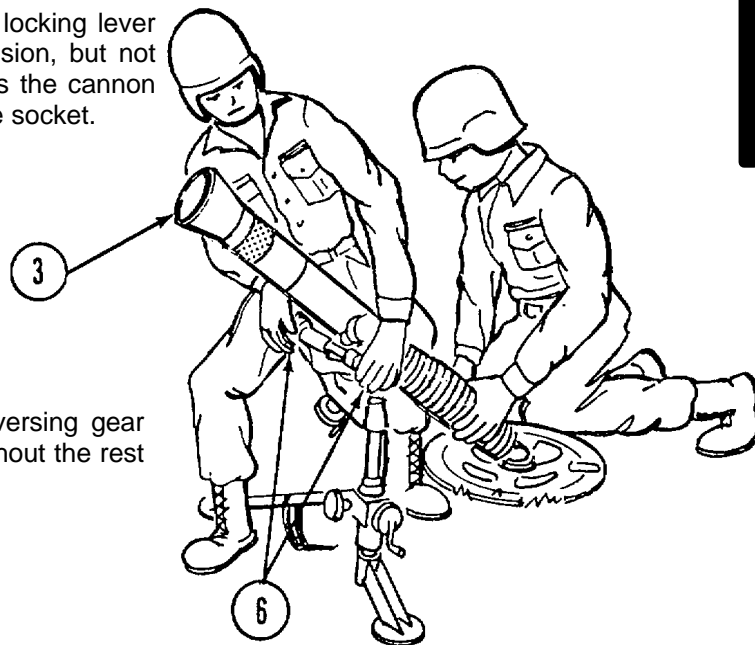
- Do not stand directly behind cannon when removing a misfire.
- Keep head and body away from the front of the mortar when removing a misfire.
- Do not open barrel clamp assembly, only loosen it.

NOTE

Gunner is shown on wrong side of cannon to permit reader to view misfire procedure .



5. The ammo handler presses barrel clamp locking lever (5) to release barrel clamp assembly tension, but not releasing barrel clamp, and carefully turns the cannon (3) 1/4 turn to release it from the baseplate socket.



6. The gunner grasps both ends of the traversing gear assembly (6) to support the mortar throughout the rest of the procedure.

7. Ammunition handler supports cannon (3).

Change 4 2-73

OPERATING PROCEDURES-MISFIRE -Continued.

8. Keeping both hands away from the muzzle the assistant gunner then places his right hand, palm up, under the BAD (3) near the muzzle. He then places his left hand, palm down, on top of the BAD (3).



WARNING

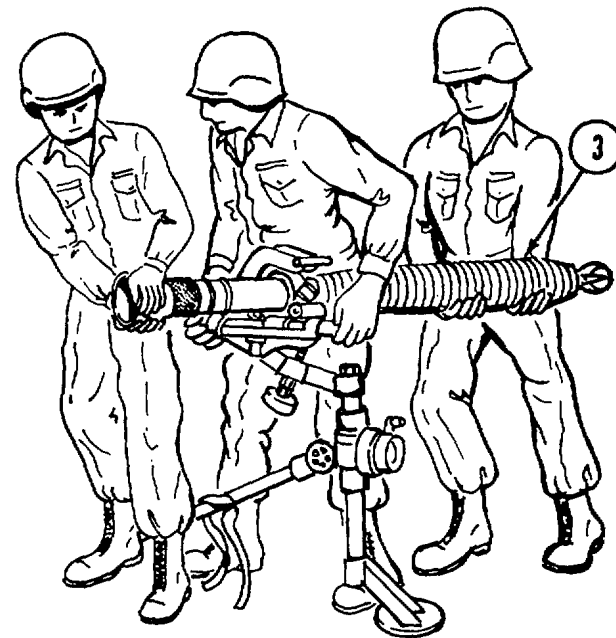
Ammunition handler must not put his hand on the breech plug when lifting and holding cannon.

9. The ammunition handler places his hands under the cannon (3) ahead of the breech plug.

WARNING

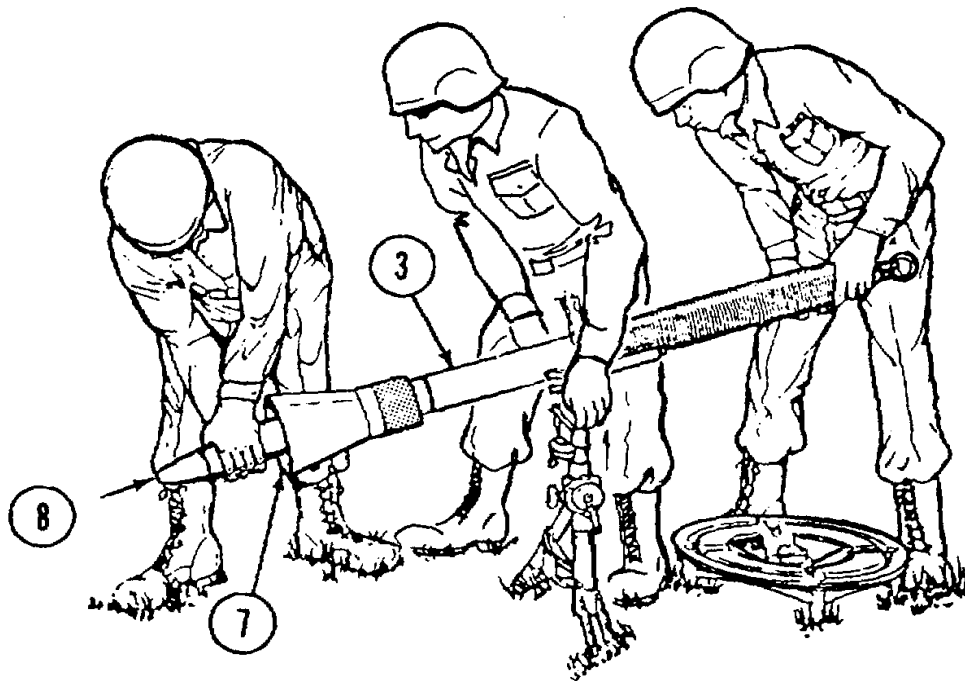
Do not lower breech plug end of cannon below a horizontal position until cartridge has been removed from cannon.

10. The ammunition handler lifts the base of the cannon (3) until it is horizontal.



OPERATING PROCEDURES-MISFIRE-Continued.

11. Only after cannon (3) is in the horizontal position does the assistant gunner place the thumb of each hand over the blast attenuator device (7).
12. Ammunition handler continues to raise cannon.
13. The assistant gunner stops the cartridge (8) with his thumbs, and without touching the fuze, removes the cartridge from the cannon.



14. If cartridge does not slide out of cannon, go to page 2-78.
15. The ammunition handler shakes the barrel to dislodge any remnants from last cartridge fire, locks the barrel into the baseplate, and swabs cannon bore.
16. If primer is dented, the ammunition handler replaces the safety wire (if applicable). He then places cartridge on the ground, tags it, and notifies Explosive Ordnance Disposal (EOD). If primer is not dented, the cartridge may be used again.
17. Gunner should check firing pin for damage or fouling before reinstalling it.
18. The mortar is then re-laid.

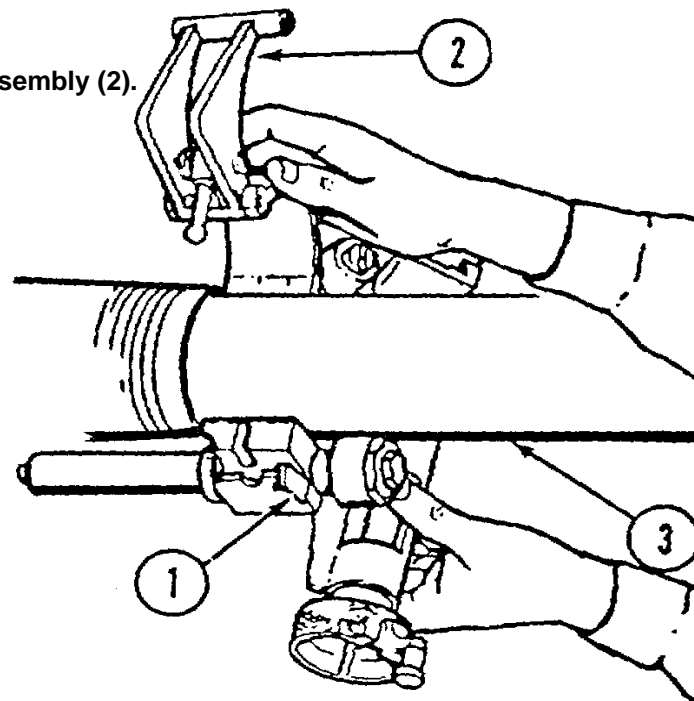
IF CARTRIDGE CANNOT BE REMOVED FROM CANNON.

1. Ammo handler keeps cannon in a horizontal position.
2. Gunner releases barrel clamp latch (1) and opens barrel clamp assembly (2).

WARNING

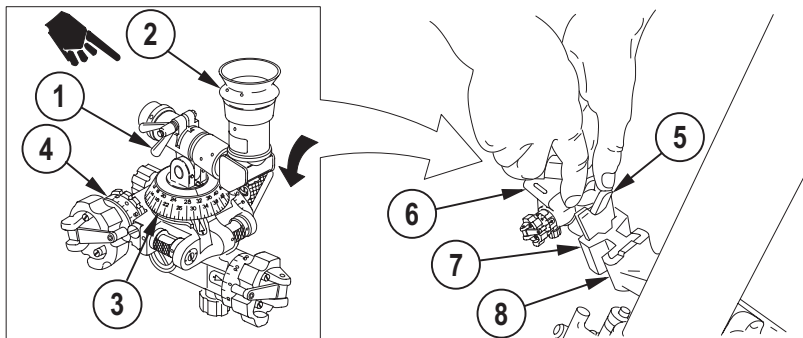
While moving cannon always point in direction of fire and insure that no crew members stand directly behind or in front of cannon.

3. Squad removes cannon (3) from barrel clamp assembly (2) and carefully carries cannon to misfire/dud pit 50 meters away from the firing line and places on ground in a horizontal position.
4. Explosive Ordnance Disposal (EOD) is notified.



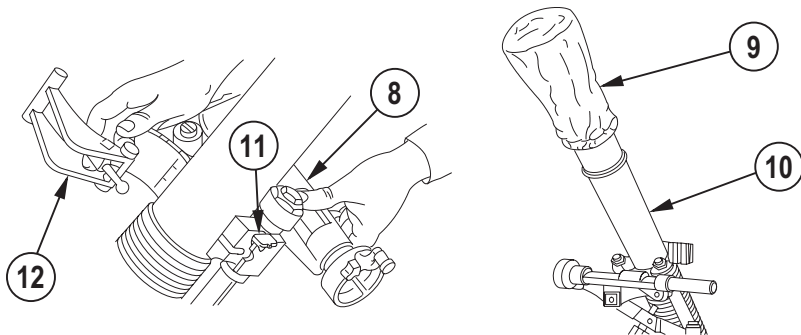
PREPARATION FOR MOVEMENT—DISASSEMBLING MORTAR AND EQUIPMENT.

1. Pull clamping mechanism (1) up and rotate elbow telescope (2) 90 degrees. Push down on clamping mechanism (1) to lock elbow telescope. Set coarse deflection scale (3) to 3200 mils and set fine deflection scale (4) to 0 mils.
2. Press latching lever (5), remove sight unit (6) from sight unit adapter (7) on bipod (8), and stow sight unit in carrying case.



PREPARATION FOR MOVEMENT—DISASSEMBLING MORTAR AND EQUIPMENT - Continued.

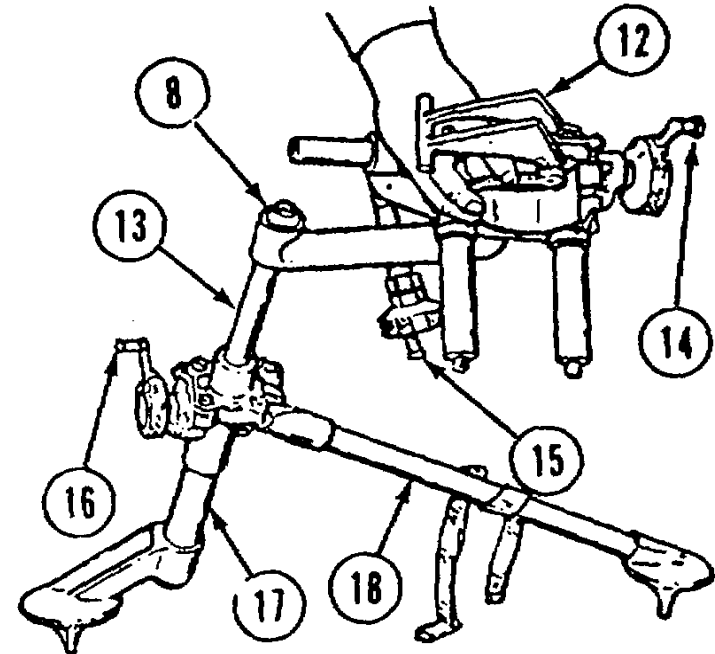
3. Retrieve aiming posts and lights and stow them in their cases.
4. Install muzzle cover (9) on cannon (10).
5. Release barrel clamp latch (11), open barrel clamp assembly (12), and carefully remove bipod (8) from cannon (10) while keeping cannon supported.



CAUTION

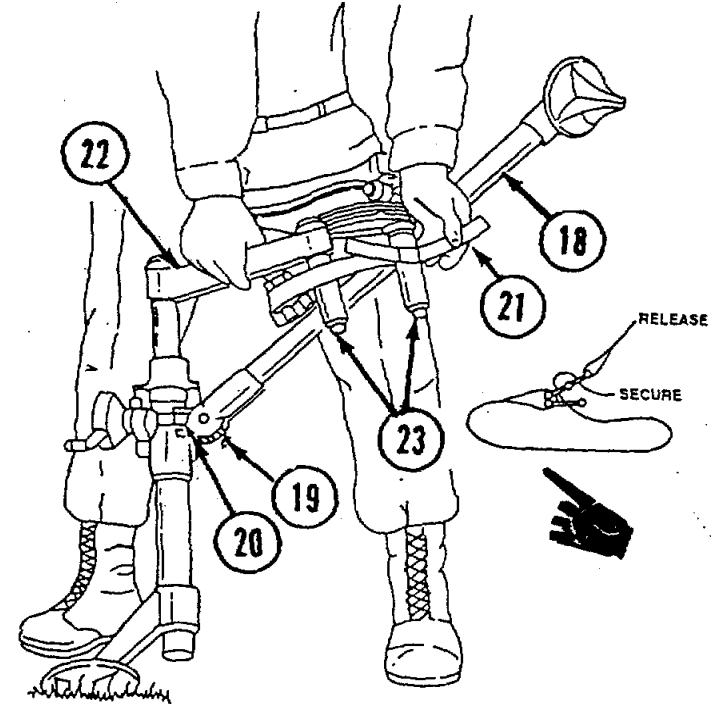
Exercise care in handling the bipod with elevating shaft extended; shaft damage could result.

6. Lock barrel clamp assembly (12), traverse bipod (8) fully right, and depress bipod until about four inches of elevating shaft (13) are visible.
7. Fold up traversing handwheel (14), cross-leveling handwheel (15), and elevating handwheel (16).
8. Lift elevating leg assembly (17) and fixed leg assembly (18) out of ground.



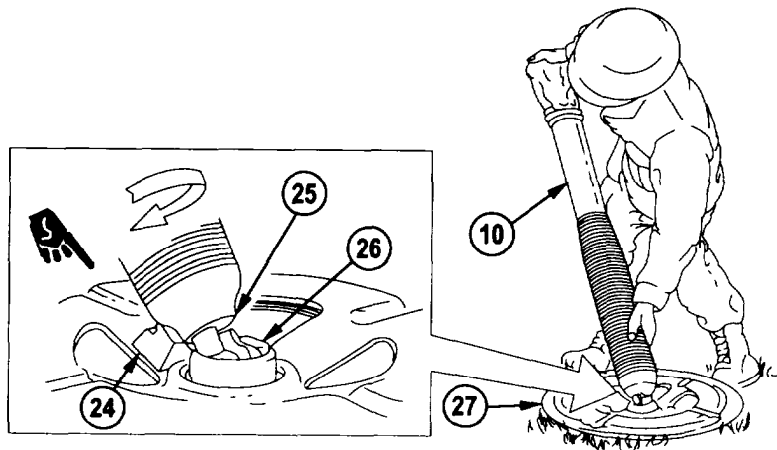
PREPARATION FOR MOVEMENT - DISASSEMBLING MORTAR AND EQUIPMENT - Continued.

9. Unlock fixed leg assembly (18) by loosening leg locking knob (19), and releasing leg locking lever (20) if necessary.
10. Fold up fixed leg assembly (18) as far as possible, and tighten leg locking knob (19).
11. Wrap webbing strap (21) around cross-leveling arm (22) and both mortar mounting buffers (23), pull tight, and secure.



ARMY TM 9-1015-249-10

PREPARATION FOR MOVEMENT-DISASSEMBLING MORTAR AND EQUIPMENT
Continued.



(2-82.1 blank)/2-82.2

Change 7

NOTE

If required, place baseplate extractor (24) between cannon's breech cap and baseplate's top surface. Pushing down on cannon will dislodge baseplate.

12. Turn cannon (10) 1/4 turn so that vertical faces of breech plug (25) align in cutaway portion of baseplate socket (26).
13. Remove cannon (10) from baseplate (27).
14. Remove baseplate (27) from ground.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

COLD.

Keep ammunition, sight unit, and boresight covered when conditions permit. Do not move fire control instruments from cold to warm areas. Use arctic lubricant.

Refer to FM 9-207, FM 31-70, and FM 31-71 for operation in cold climates.

HOT.

Lubricate cannon, bipod, and baseplate frequently with general purpose lubricating oil (item 12, app D), paying particular attention to all hidden surfaces such as bore, firing pin, and similar places where corrosion might occur. Clean, wipe dry, and restore oil film after handling. Keep equipment covered when conditions permit.

HOT AND DRY.

Clean and oil the bore of cannon more frequently than usual. Keep equipment covered when conditions permit.

HOT, DAMP, AND SALTY ATMOSPHERE.

1. When mortar is being fired, clean and lubricate the bore and exposed metal surface more frequently than required for normal service and keep covers in place as often as firing conditions permit.
2. When mortar is not being used, cover unpainted surfaces with a film of general purpose lubricating oil (item 12, app D) and keep all covers in place.
3. Check optical instruments for fungus growth.

SAND.

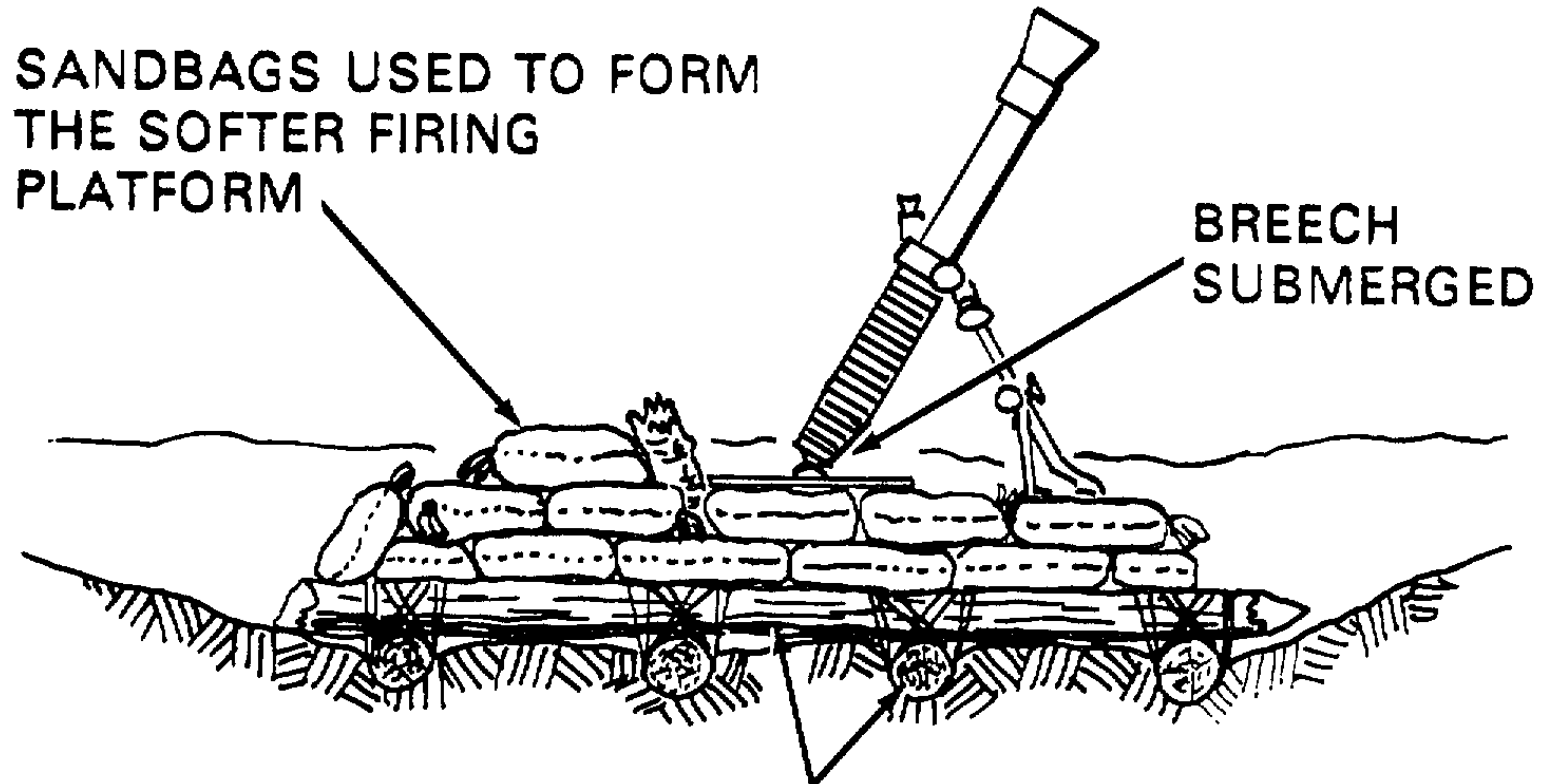
1. Clean and lubricate materiel frequently.
2. When beginning an action in sandy areas:
 - (a) Remove lubricant from machined surfaces of cannon and other exposed lubricated parts.
 - (b) Clean and lubricate all exposed parts after action is over.

MUD.

Firing on very soft ground will require ground preparation (e.g., sandbags).

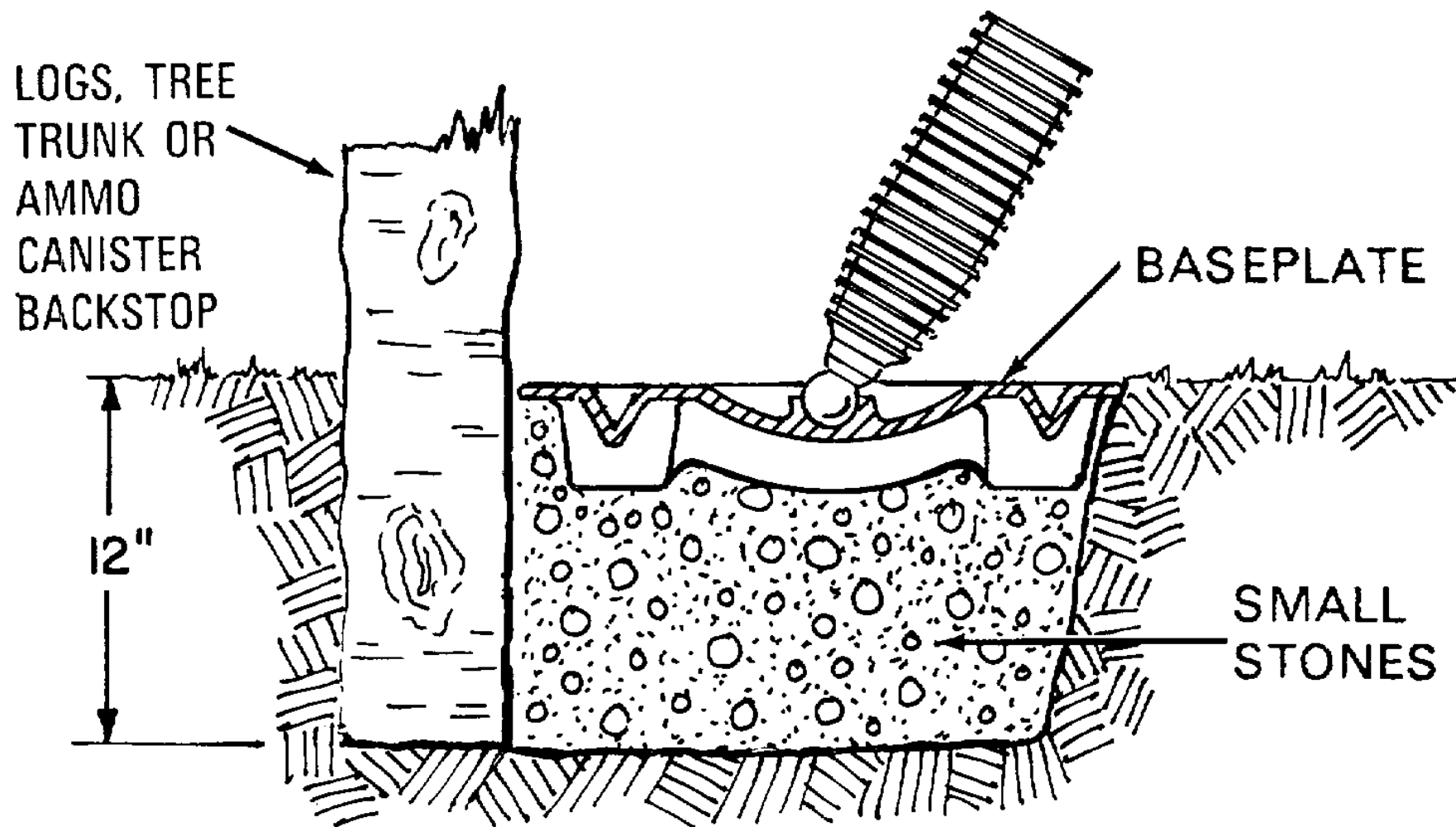
GROUND PREPARATION BEFORE FIRING

The following Illustrations are alternate methods for emplacing Mortar.



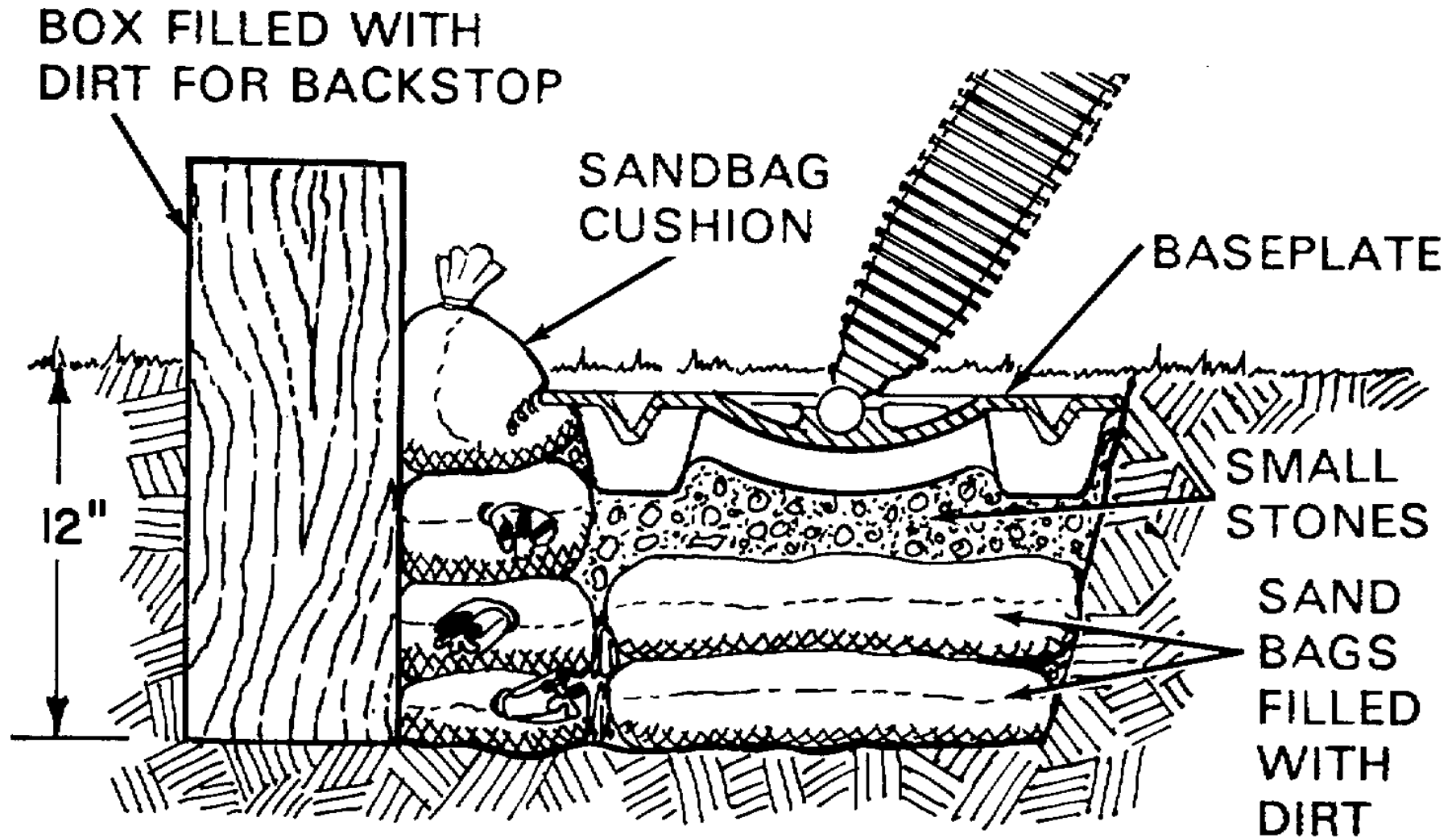
LOGS LASHED TOGETHER TO FORM
THE HARD PLATFORM AND BACK STOP

SNOW OR VERY SOFT GROUND



SOFT GROUND

Change 2 2-88

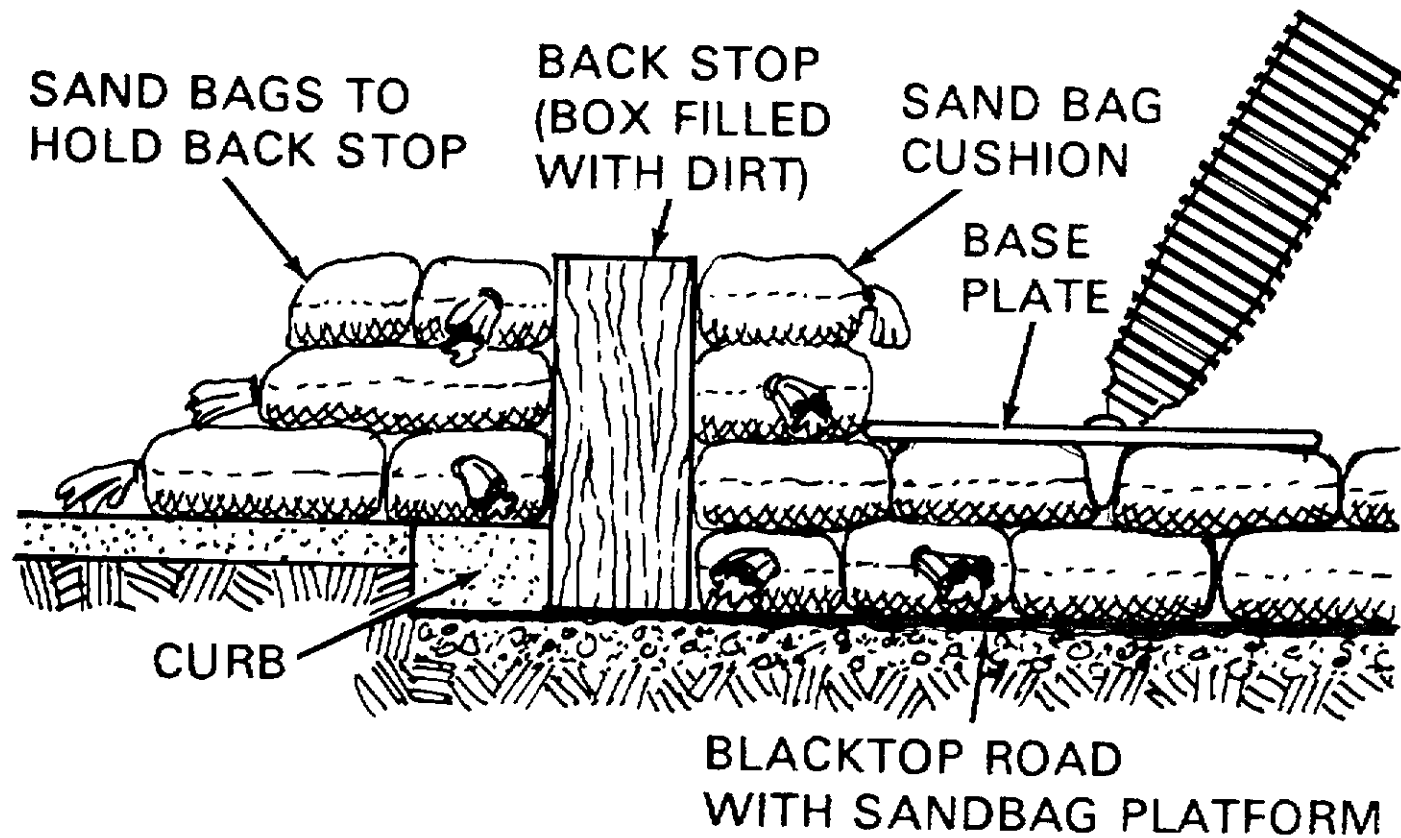


SOFT GROUND

Change 2 2-89

FROZEN, HARD OR ROCKY SURFACES.

1. Use sandbags to seat baseplate.
2. Use tripods to support the aiming posts.
3. See FM 31-70, FM 31-71, and FM 9-207.



FORDING.

1. Disassemble weapon into major components (page 2-79) and cover the components carefully to protect from water splashes.
2. Watch carefully for water seepage into all parts. This could contaminate the lubricant.
3. If immersion occurs, notify organizational maintenance to schedule disassembly and lubrication by direct support maintenance at first opportunity.

NUCLEAR, BIOLOGICAL, AND CHEMICAL INDC) DECONTAMINATION PROCEDURES.

See FM 3-4, FM 3-5 and FM 3-87.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

NOTE

- **These lubrication instructions are mandatory.**
- **General purpose lubricating oil (GPL oil) (item 12, app D) is the prime lubricant. LAW (item 13, app D) may be used for continuous sub-zero environments.**

1. Intervals are based on usual operating conditions. For unusual operating condition, do the lubricating procedures more often. When the weapon is not in use, the intervals may be extended if proper lubrication procedures have been followed.

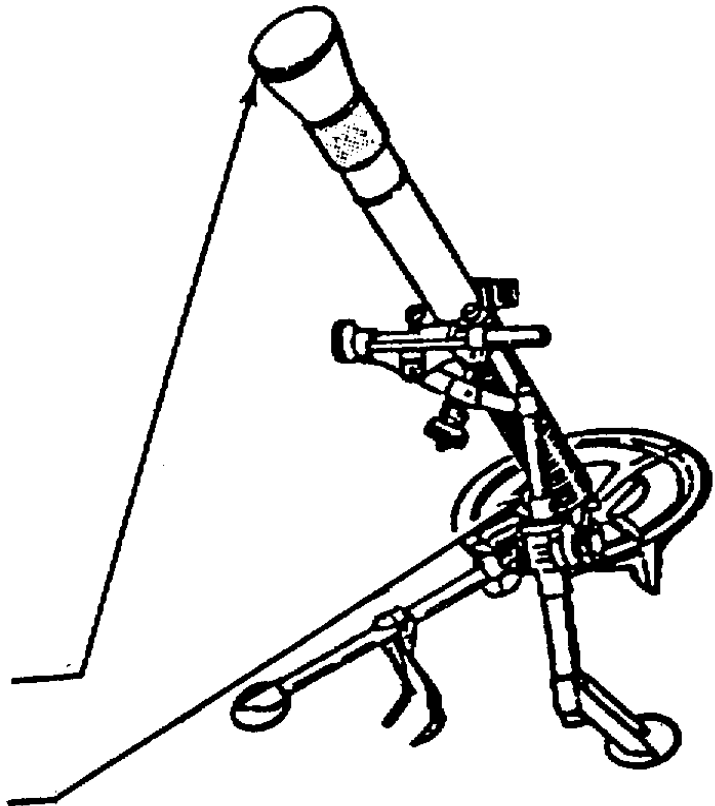
WARNING

Dry cleaning solvents (SD) and paint thinners (TPM) are flammable. Do not clean parts near an open flame or in a smoking area. Dry cleaning solvents and paint thinners evaporate quickly and have a drying effect on the skin. When used without protective gloves, these chemicals may irritate or crack the skin.

- 2. Clean parts with dry cleaning solvent (item 8, app D) and dry before lubricating.
- 3. See FM 9-207 for arctic lubrication.

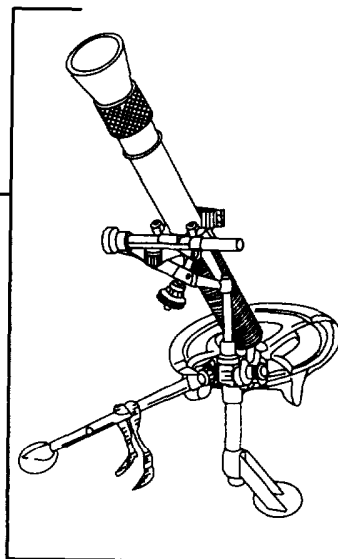
INTERVAL W - Weekly

	<u>LUBRICANT</u>	<u>INTERVAL</u>
CANNON BORE (See note 1)	GPL OIL	W
FIRING PIN	GPL OIL	W



LUBRICANT INTERVAL
OUTSIDE SURFACES GPL OIL
(see notes 2,3,4, and 5)

W



Change 5

3-3

ARMY TM 9-1015-249-10

NOTE 1. Immediately after firing, and for two consecutive days thereafter, clean the cannon bore with RBC (item 6, app D), using wire mesh pad (item 26, app B) attached to head section (item 25, app B). After the third cleaning, wipe dry and lightly coat with general purpose lubricating oil (item 12, app D). When mortar is not being fired, clean weekly with RBC, wipe dry, and lube with general purpose lubricating oil.

NOTE 2. Weekly, clean and wipe the entire outside surface of cannon, bipod, and baseplate with general purpose lubricating oil (item 12, app D).

NOTE 3. Weekly, or as needed, fully extend the traversing, elevating, and cross-leveling assemblies to wipe clean and lubricate exposed surfaces with general purpose lubricating oil (item 12, app D).

NOTE 4. Weekly, or as needed, carefully clean cooling fins at breech end of cannon to assure maximum heat transfer. Do not allow dirt or foreign matter to build up on the cooling fins.

NOTE 5. Mortar mount is required to be serviced semiannually by support maintenance.

Section II. TROUBLESHOOTING PROCEDURES

The table lists the common malfunctions which you may find during the operation of the 81-mm mortar or its components. You should perform the tests/inspections and corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

TROUBLESHOOTING - Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. MORTAR FAILS TO FIRE

WARNING

1

Follow misfire procedures on page 2-68.1 to remove round before doing troubleshooting.

Step 1. Check for defective ammunition.

2

Follow misfire procedures starting on page 2-68.1 to dispose of round.

Step 2. Check for dented or bent barrel.

Notify organizational maintenance.

TROUBLESHOOTING-Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 3. Check for dirt or foreign matter in cannon.		Remove foreign matter, and clean thoroughly with RBC (item 6, app D).
Step 4. Check for loose firing pin.		Using firing pin wrench, remove, clean and install firing pin (page 2-70).
Step 5. Check for broken firing pin.		Replace firing pin (page 2-70).

TROUBLESHOOTING-Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

2. MORTAR IS DIFFICULT TO TRAVERSE.

Turn traversing handwheel and check for binding or inoperative parts.

Notify organizational maintenance.

3. MORTAR IS DIFFICULT TO ELEVATE OR DEPRESS.

Turn elevating handwheel and check for binding or inoperative parts.

Notify organizational maintenance.

TROUBLESHOOTING-Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

4. MORTAR DOES NOT RECOIL PROPERLY.

Check for binding or damaged mortar mounting buffers by pulling down on both buffers at the same time; they should return to original position when released.

Notify organizational maintenance.

5. MORTAR IS DIFFICULT TO CROSS-LEVEL.

Turn cross-leveling handwheel and check for binding or inoperative parts.

Notify organizational maintenance.

TROUBLESHOOTING-Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

6. EXCESSIVE BACKLASH IN TRAVERSING, ELEVATING, OR CROSS-LEVELING HANDWHEELS.

Check if backlash in the handwheels exceeds one-eighth of a turn (45°).

Notify organizational maintenance.

7. BASEPLATE SOCKET IS FROZEN OR DIFFICULT TO ROTATE.

Check for dirt or foreign matter in baseplate socket.

Remove foreign matter or dirt. If socket is still difficult to rotate, notify organizational maintenance.

TROUBLESHOOTING - Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

8. SIGHT UNIT WILL NOT SEAT IN SIGHT UNIT ADAPTER.

Step 1. Check sight unit dovetail and sight unit adapter for dirt or foreign matter.

Remove foreign matter and clean thoroughly.

Step 2. Check sight unit dovetail and sight unit adapter for loose paint, nicks, or burrs.

Remove loose paint, nicks, or burrs with abrasive cloth (item 7, app D).

Step 3. Check for broken or bent sight unit dovetail.

Notify organizational maintenance.

Step 4. Check for broken or bent sight unit adapter.

Notify organizational maintenance.

TROUBLESHOOTING - Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. SIGHT UNIT CONTROLS DO NOT OPERATE.

Step 1. Check to see if locking knobs are tightened.

Release locking knobs.

Step 2. Check for dirt and grit.

Clean thoroughly. If they are still inoperative, notify organizational maintenance.

Step 3. Check coarse azimuth scale and micrometer azimuth dial to ensure no movement unless depressed.

Notify organizational maintenance.

TROUBLESHOOTING - Continued.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

10. POOR VISIBILITY IN SIGHT UNIT LENS.

Step 1. Check lens for cracks or breaks.

Notify organizational maintenance.

CAUTION

Do not apply heat directly to sight unit lens.

Step 2. Check lens for moisture.

Place sight unit in a warm area to see if moisture clears. If moisture doesn't clear, notify organizational maintenance.

Section III. MAINTENANCE PROCEDURES

INTRODUCTION.

Operator maintenance is limited to inspecting and servicing components as outlined in the following instructions:

1. PMCS procedures - page 2-7.
2. Lubrication instructions - page 3-1.
3. Cleaning instructions for optical parts - page 3-15.
4. Firing pin replacement - page 2-70.

WARNING

Dry cleaning solvents (SD) and paint thinners (TPM) are flammable. Do not clean parts near an open flame or in a smoking area. Dry cleaning solvents and paint thinners evaporate quickly and have a drying effect on the skin. When used without protective gloves, these chemicals may irritate or crack the skin.

The operator may also touch up the paint on the M3A1 baseplate and the sight unit adapter using polyurethane coating (item 9, app D), brush (item 4, app D), and synthetic thinner (item 16, app D). The bipod may be touched up using lacquer (item 11, app D).

CARE AND CLEANING OF OPTICAL PARTS.

CAUTION

- **Keep exposed surfaces of lenses and other parts clean and dry to prevent or retard corrosion of metal and etching of surfaces of glass.**
- **Never use polishing liquids, pastes, or abrasives to polish lenses and windows.**

WIPING.

1. Use only lens paper (item 14, app D), especially intended for cleaning optical glass.
2. Do not use cleaning cloths on optical surfaces.

CARE AND CLEANING OF OPTICAL PARTS - Continued.

CLEANING.

1. Keep optical parts free from oil and grease.
2. Do not touch lenses or windows with bare fingers.
3. Apply alcohol (item 1, app D) with lens paper (item 4, app D) and wipe gently with clean lens paper to remove oil or grease from optical surfaces.
4. If alcohol is not available and temperature is above freezing, breathe heavily on glass and wipe off with clean lens paper. Repeat this operation until clean.

COLD WEATHER CLEANING.

1. Clean optical surfaces with lens paper moistened with alcohol.
2. If alcohol is not available, use dry lens paper.
3. Wipe gently to avoid scratching or removing coated surface of optics.

MOISTURE.

1. Condensation may cause moisture to collect on optical parts of instrument when temperature of parts is lower than that of surrounding air.

CAUTION

Do not apply heat directly from concentrated sources. This could cause unequal expansion of parts, leading to damage and inaccurate functioning of optical parts.

2. If moisture from condensation is not excessive, you can remove it by placing instruments in a warm place.
3. If moisture from condensation is excessive, notify organizational maintenance.

CHAPTER 4

AMMUNITION

Section I. AUTHORIZED CARTRIDGES AND FIRING TABLES

The following cartridges are authorized to be fired in the M252 Mortar when appropriate firing tables are used:

<u>Cartridges</u>	<u>Firing Tables</u>
Cartridge, 81-MM: HE, M821	FT 81-AR-1
Cartridge, 81-MM: HE, M889	FT 81-AR-1
Cartridge, 81-MM: HE, M889A1	FT 81-AR-1, C-3
Cartridge, 81-MM: HE, M821A1	FT 81-AR-1, C-3
Cartridge, 81-MM: HE, M374A3	FT 81-AQ-1
Cartridge, 81-MM: HE, M374A2, M374A1, and M374	FT 81-AI-3
Cartridge, 81-MM: HE, M362A1 and M362	FT 81-AQ-1, C-1
Cartridge, 81-MM: Smoke, RP, M819	FT 81-AR-1

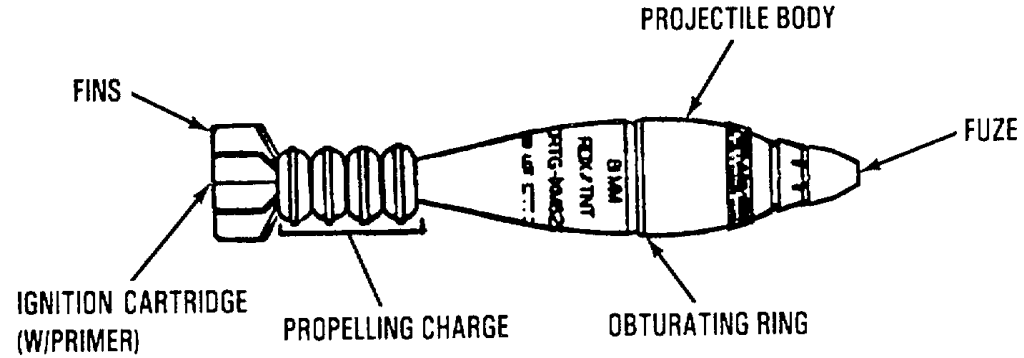
Cartridges

Cartridge, 81-MM: Smoke, WP, M375A3
 Cartridge, 81-MM: Smoke, WP, M375A2, M375A1, and M375
 Cartridge, 81-MM: Illum, M853A1
 Cartridge, 81-MM: Illum, M301A3
 Cartridge, 81-MM: Illum, M301A2 and M301A1
 Cartridge, 81-MM: Illum, M816
 Cartridge, 81-MM: Practice, M879
 Cartridge, 81-MM: Practice, SR, M880
 Cartridge, 81 -MM: Training, M68
 81-MM Mortar Training Device (SABOT)

Firing Tables

FT 81-AQ-1, C-1
 FT 81-AI-3
 FT 81-AR-1, C-1
 FT 81-AI-3
 FT 81-AB-2
 TBD
 FT 81-AR-1, C-1
 FT 81-M5
 FT 81-AI-3
 FT 81-AO-1

M821 HE CARTRIDGE



TYPE/USE: High explosive/fragmentation and blast

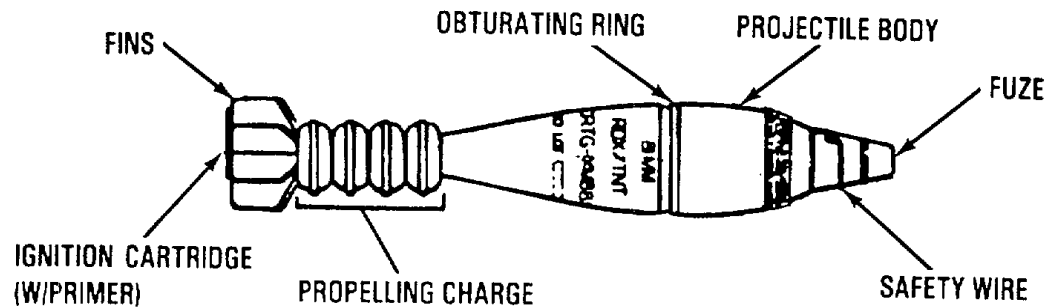
IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze, Multi-option, M734
Propelling Charge, M223

MAXIMUM RANGE: 5608 meters

AUTHORIZED CARTRIDGES - Continued.

M889 HE CARTRIDGE

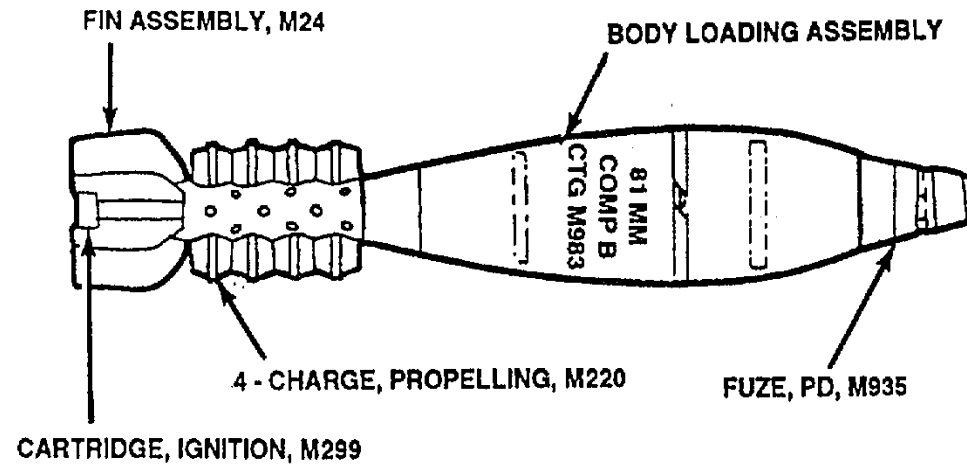


TYPE/USE: High explosive fragmentation and blast

IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze, Point Detonating, M935
Propelling Charge, M223

MAXIMUM RANGE: 5608 meters

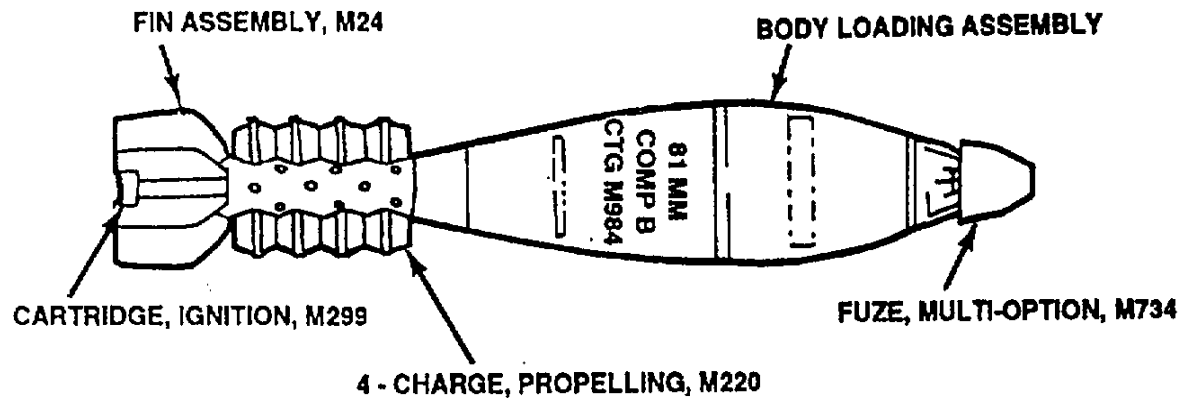
M889A1 HE CARTRIDGE

TYPE/USE: High explosive/fragmentation and blast

IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze, Point Detonating, M935
Propelling Charge, M220

MAXIMUM RANGE: 5935 meters

AUTHORIZED CARTRIDGES - Continued.**M821A1 HE CARTRIDGE**

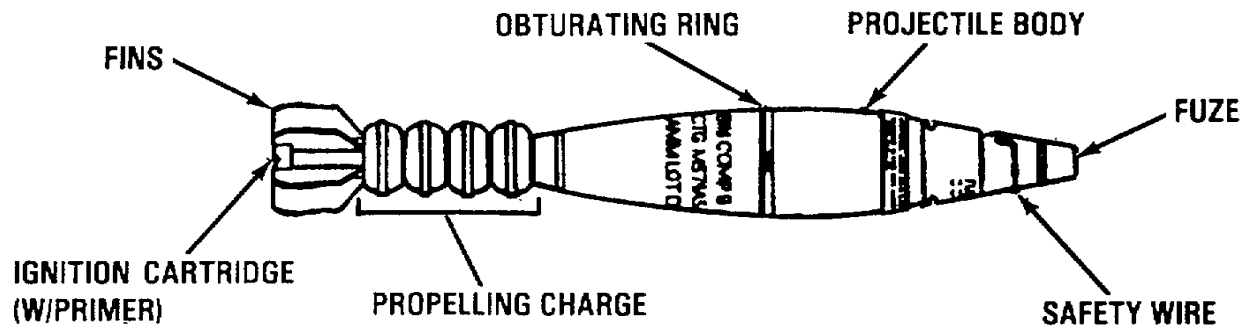
TYPE/USE: High explosive/fragmentation and blast

IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze, Multi-Option, M734
Propelling Charge, M220

MAXIMUM RANGE: 5935 meters

M374A3 HE CARTRIDGE



TYPE/USE: High explosive/fragmentation and blast

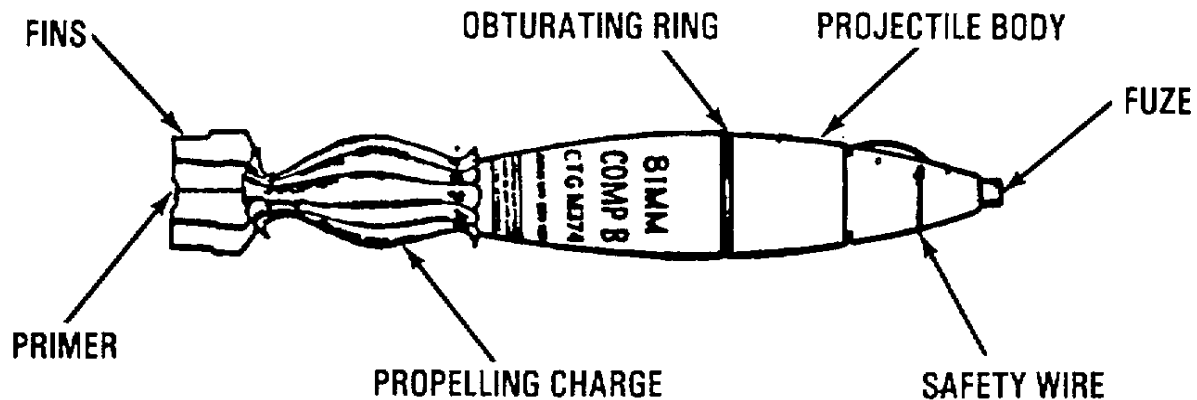
IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze, Point Detonating, M567 or M524 (series)
 Propelling Charge, M205

MAXIMUM RANGE: 4800 meters

AUTHORIZED CARTRIDGES - Continued.

M374A2, M374A1 AND M374 HE CARTRIDGE



TYPE/USE: High explosive/fragmentation and blast

IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze - Point Detonating M524 (series),
 - Point Detonating M526 (series),
 - Point Detonating M567, or
 - Proximity, M532
 Propelling Charge, M90 (M374 cartridge) or M90A1
 (M374A1 and M374A2 cartridges)

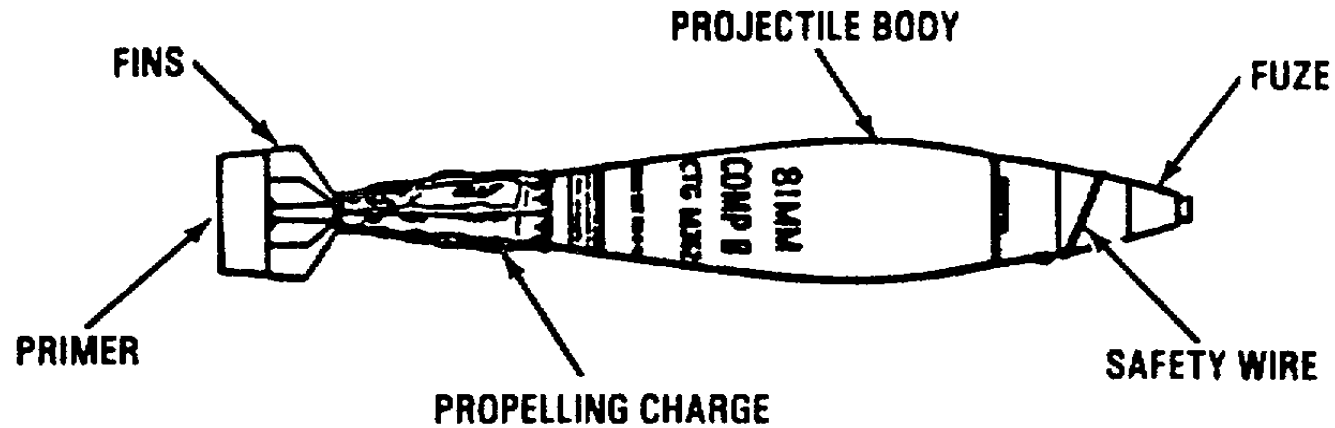
MAXIMUM RANGE: 4500 meters

LIMITATIONS:

1. Cartridges assembled with Fuze, PD M524 (A1, A2, A3, and A4) are for USMC/USN use only.
2. Cartridges assembled with Fuze, Proximity M532 must be fired above charge 0.
3. Short rounds may be expected when firing below charge 4.

AUTHORIZED CARTRIDGES - Continued.

■ M362A1 AND M362 HE CARTRIDGE



TYPE/USE: High explosive/fragmentation and blast

IDENTIFICATION: Olive drab w/yellow markings

COMPONENTS: Fuze - Point Detonating, M524 (series)
 - Point Detonating, M526 (series)
 - Proximity, M532
 Propelling Charge, M5

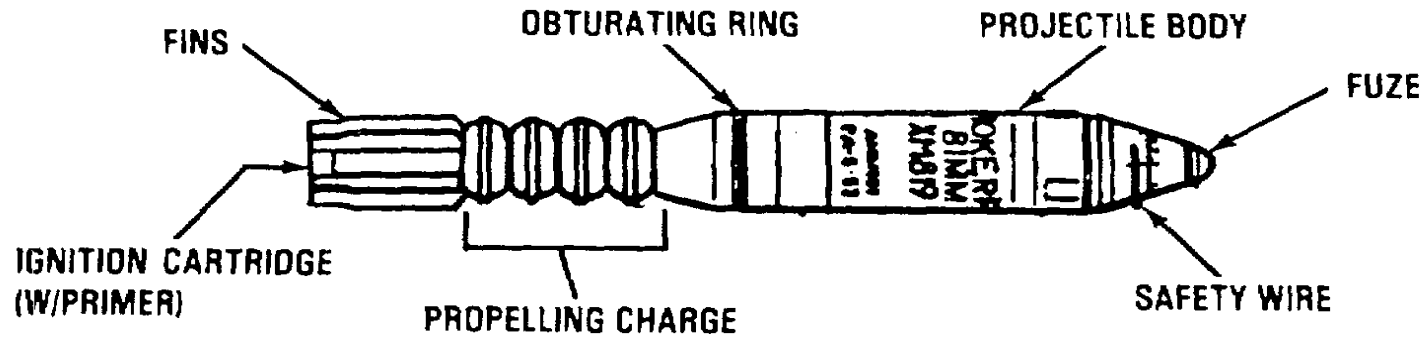
MAXIMUM RANGE: 3600 meters

LIMITATIONS:

1. Cartridges assembled with Fuze, PO, M524 (A1, A2, A3, and A4) are for USMC/USN use only.
2. Cartridges assembled with Fuze, Proximity M532 must be fired above charge 0.

AUTHORIZED CARTRIDGES-Continued.

M819 SMOKE CARTRIDGE



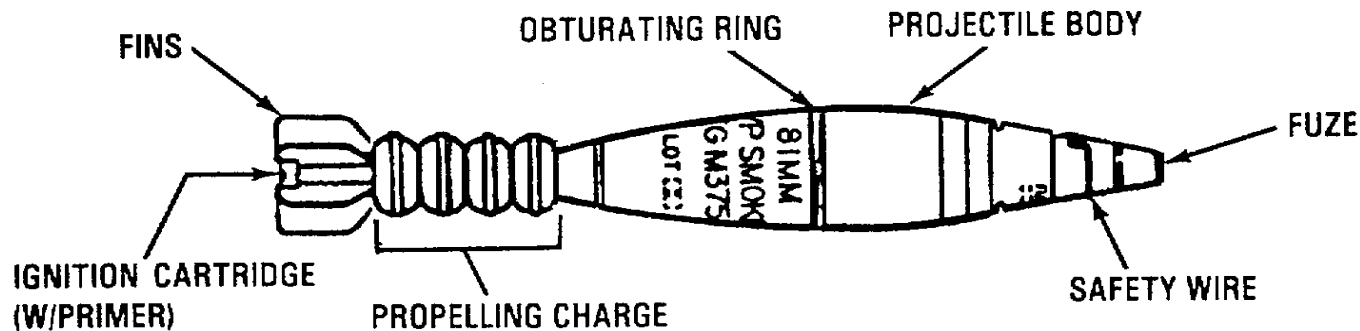
TYPE/USE: Smoke (Red phosphorous pellets) /screening. To be fired in 3 round volleys (after registration) for initial screen deployment and approximately 1 round/min thereafter for screen sustainment, depending upon weather conditions.

IDENTIFICATION: Light green w/black markings and one brown band

COMPONENTS: Fuze, Mechanical Time Superquick, M772
Propelling Charge, M218

MAXIMUM RANGE: 4875 meters (impact)

M375A3 SMOKE CARTRIDGE



TYPE/USE: Smoke (white phosphorous)/spotting and incendiary

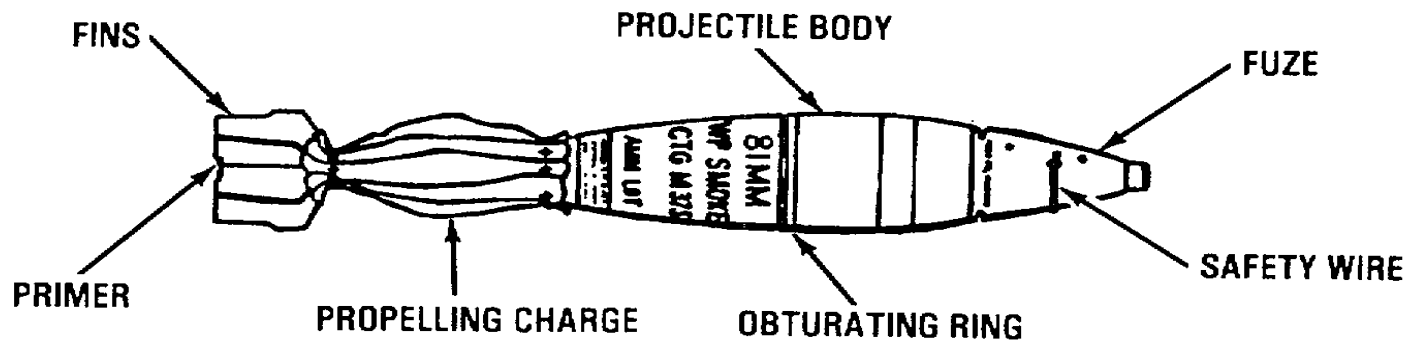
IDENTIFICATION: Light green w/light red markings and one yellow band

COMPONENTS: Fuze, Point Detonating, M567 or M524 (series)
Propelling Charge, M205

MAXIMUM RANGE: 4800 meters

AUTHORIZED CARTRIDGES - Continued.

M375A2, M375A1 AND M375 SMOKE CARTRIDGE



TYPE/USE: Smoke (white phosphorous)/spotting and incendiary

IDENTIFICATION: Light green w/light red markings and one yellow band

COMPONENTS: Fuze - Point Detonating, M524 (series),
 - Point Detonating M526 (series), or
 - Point Detonating M567
 Propelling Charge, M90 (M375 cartridge) or M90A1
 (M375A1 and M375A2 cartridges)

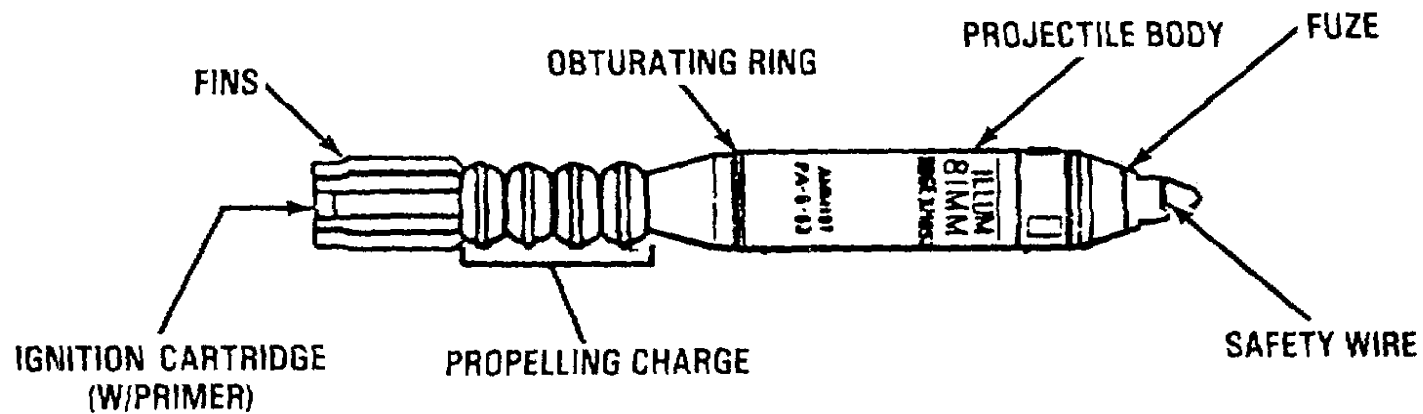
MAXIMUM RANGE: 4500 meters

LIMITATIONS:

1. Cartridges assembled with Fuze, PD M524 (A1, A2, A3, and A4) are for USMC/USN use only.
2. Short rounds may be expected when firing below charge 4.

AUTHORIZED CARTRIDGES - Continued.

M853 ILLUMINATING CARTRIDGE



TYPE/USE: Illumination

IDENTIFICATION: White w/black markings

COMPONENTS: Fuze - Mechanical Time Superquick, M772 or
 - Time, M768
 Propelling Charge, M219

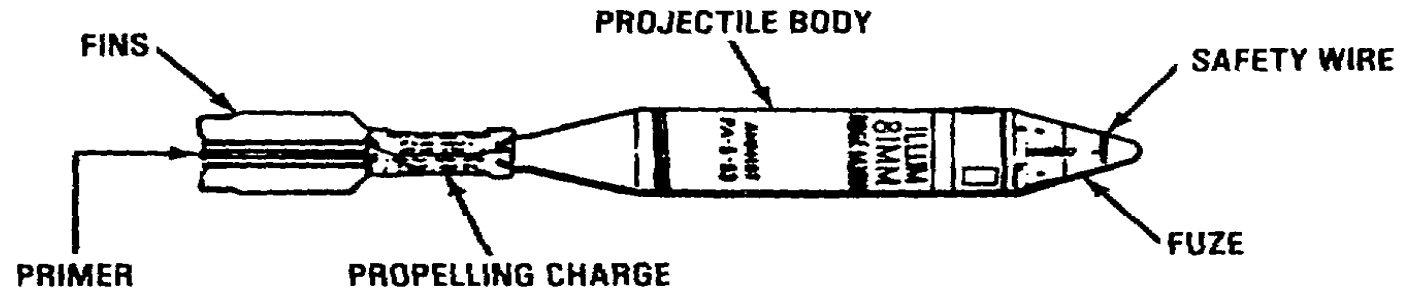
MAXIMUM RANGE: 5100 meters (burst)

REMARKS:

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 600,000 candlepower illumination for at least 60 seconds.

AUTHORIZED CARTRIDGES - Continued.

M301A3 ILLUMINATING CARTRIDGE



TYPE/USE: Illumination

IDENTIFICATION: White w/black markings

COMPONENTS: Fuze, Time, M84A1
Propelling Charge, M185

MAXIMUM RANGE: 3150 meters (burst)

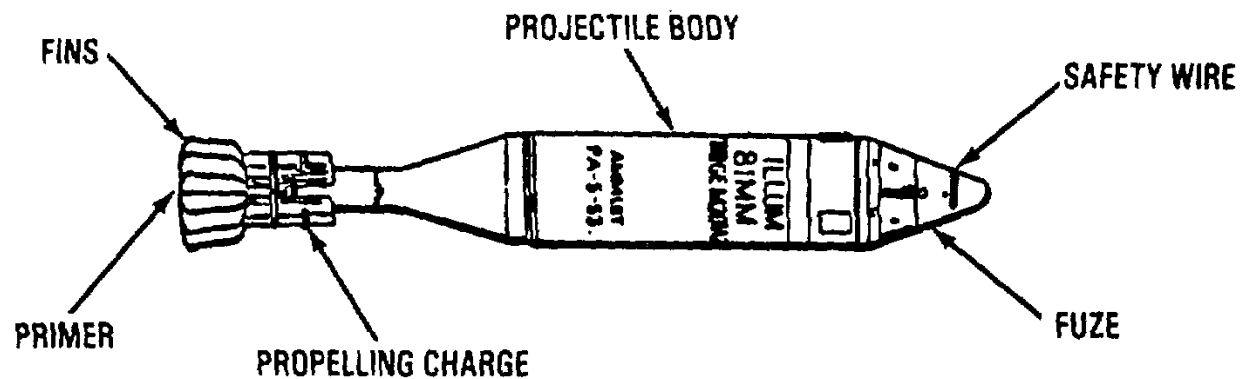
LIMITATION: Cartridge cannot be fired below charge 3.

REMARKS:

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 500,000 candlepower illumination for at least 60 seconds.

AUTHORIZED CARTRIDGES - Continued.

M301A2 AND M301A1 ILLUMINATING CARTRIDGE



TYPE/USE: Illumination

IDENTIFICATION: White w/black markings

COMPONENTS: Fuze, Time M84
Propelling Charge, M2A1

MAXIMUM RANGE: 2150 meters (burst)

LIMITATIONS: Cartridge cannot be fired below charge 2.

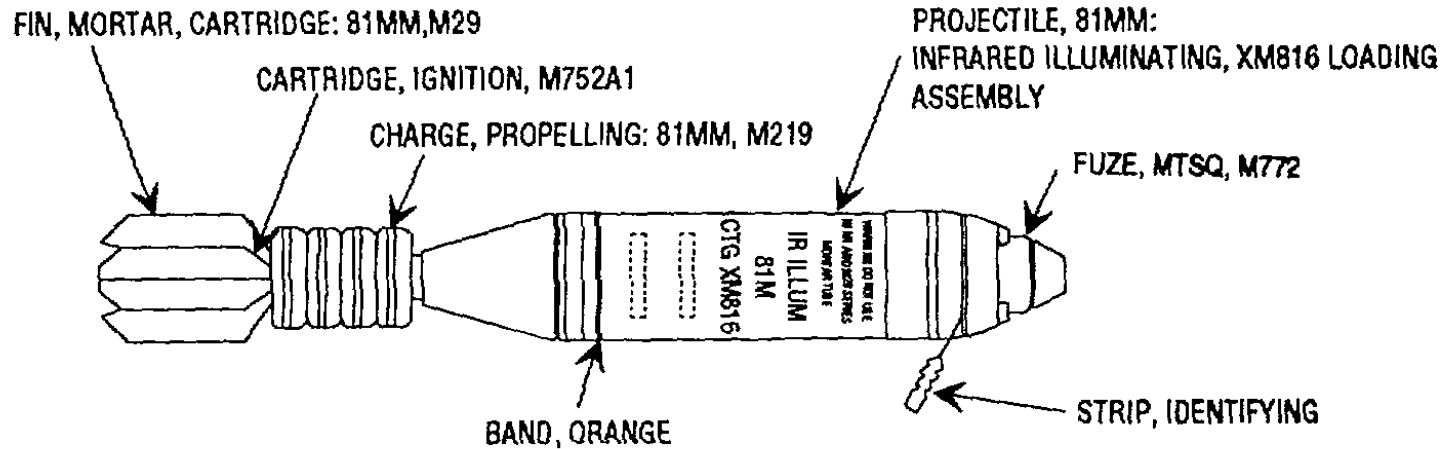
REMARKS:

1. Cartridge contains an illuminating candle/parachute assembly.
2. Candle provides a minimum of 500,000 candlepower illumination for at least 60 seconds.

Change 5 4-16.1

AUTHORIZED CARTRIDGES - Continued.

M816 ILLUMINATING, INFRARED (IR) CARTRIDGE



TYPE/USE: Illumination, Infrared (IR)

IDENTIFICATION: White w/black markings and one orange band

COMPONENTS: Fuze, Mechanical Time Superquick, M772
Propelling Charge - M219

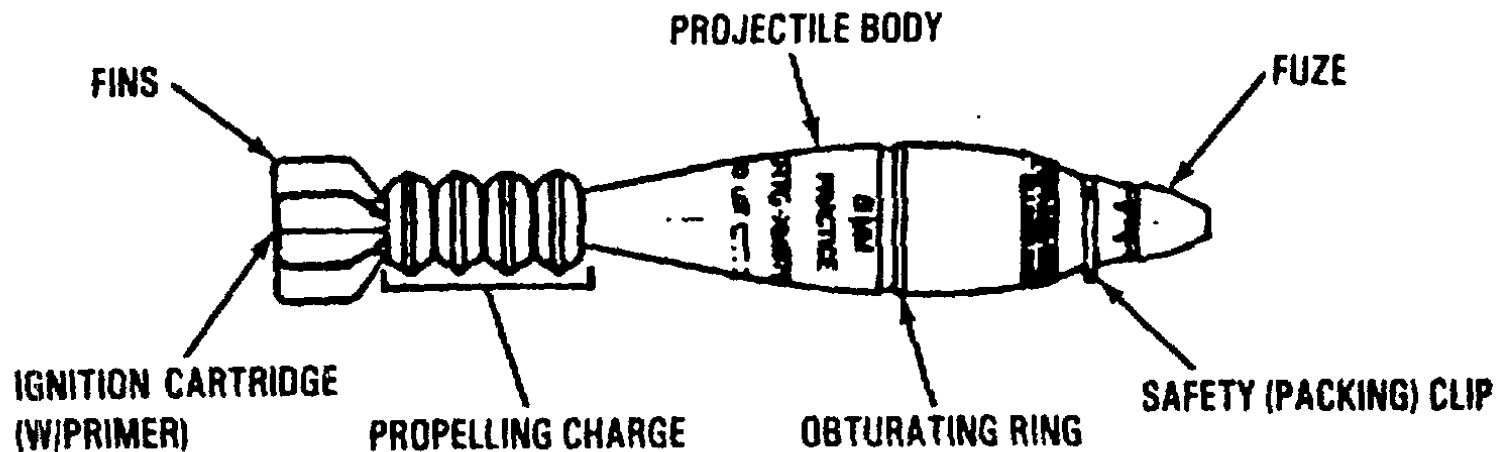
MAXIMUM RANGE: 5100 meters (air burst)

REMARKS:

1. Cartridge contains an illuminating infrared charge and parachute assembly.
2. Cartridge is marked with an orange band to identify it as an infrared (IR) cartridge.
3. User must use night vision device to expose enemy forces in darkness.
4. Charge provides a minimum infrared illumination for at least 60 seconds.

AUTHORIZED CARTRIDGES - Continued

M879 PRACTICE CARTRIDGE



TYPE/USE: Target practice (full range)/training

IDENTIFICATION: Blue w/white markings and one brown band

COMPONENTS: Fuze, Point Detonating (Practice) M751
(Type I or Type II)
Propelling Charge, M220

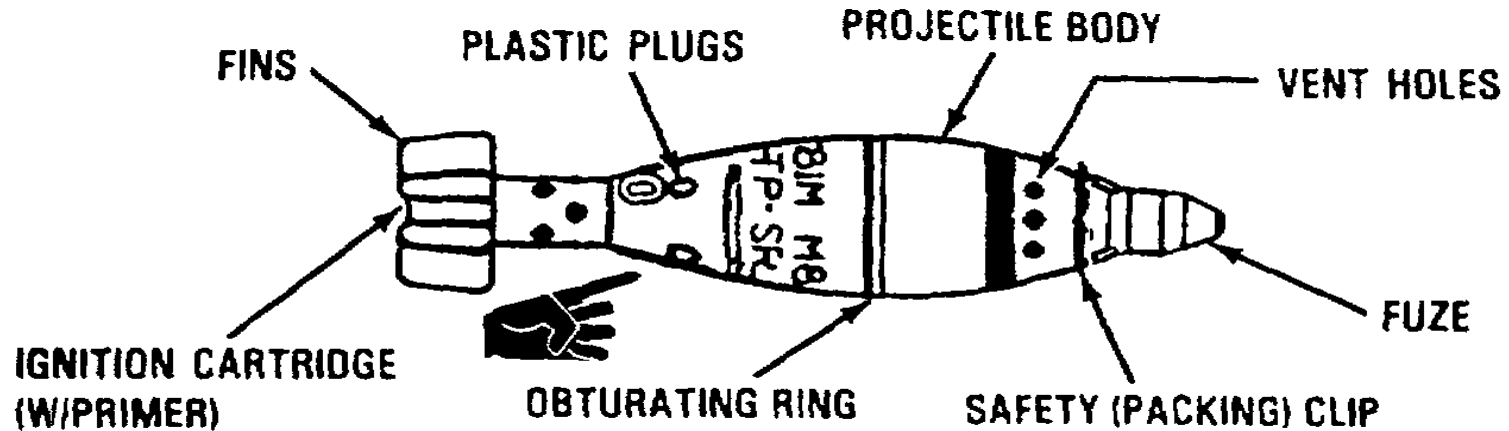
MAXIMUM RANGE: 5600 meters

REMARKS:

1. Cartridges with Type I, M751 Fuzes resemble M821 HE cartridges (as shown on page 4-1).
2. Cartridges with Type II, M751 Fuzes resemble M889 HE cartridges (as shown on page 4-2).
3. Projectile body contains an inert fill.
4. A pyrotechnic smoke charge in the fuze produces a flash, an audible sound and a smoke cloud on impact.
5. A high dud rate may be encountered when firing the M879 at charge 0.

AUTHORIZED CARTRIDGES - Continued.

M880 PRACTICE CARTRIDGE



TYPE/USE: Target practice (short range)/training

IDENTIFICATION: Blue w/white markings and one brown band

COMPONENTS: Fuze, Point Detonating (Practice) M775
(Type I or Type II)
Propelling Charge - ignition cartridge only

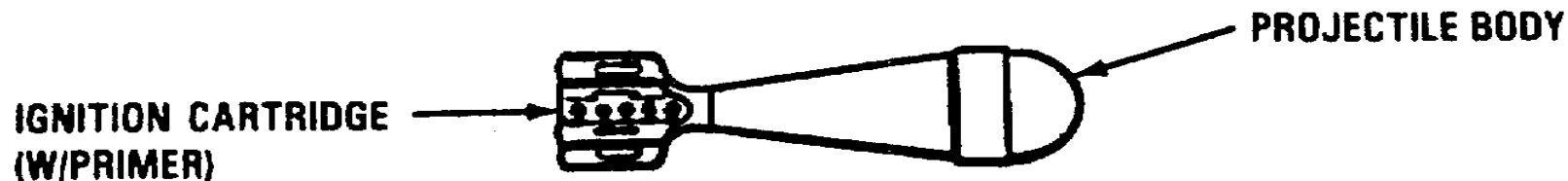
MAXIMUM RANGE: 458 meters

REMARKS:

1. Projectile body is hollow.
2. Range of cartridge is reduced by removing plastic plugs from projectile body. Removal of plugs allows gases to escape (from the mortar barrel) through the body and out the vent holes.
3. A pyrotechnic smoke charge in the fuze produces a flash, an audible sound, and a smoke cloud on impact.
4. The spent (fired) projectiles can be recovered for rebuilding and reuse. Refer to TM 9-1315-252-10 for instructions and limitations.

AUTHORIZED CARTRIDGES - Continued

M68 TRAINING CARTRIDGE



TYPE/USE: Training

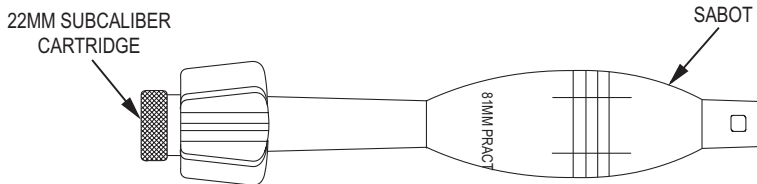
IDENTIFICATION: Blue w/white markings

COMPONENTS: Fuze - none
Propelling Charge - M6 or M3 ignition cartridge only

MAXIMUM RANGE: 280 meters

REMARKS:

1. Cartridge is fired with ignition cartridge only.
2. Cartridge can be re-used. Ignition cartridge and/or primer must be replaced.

81MM MORTAR TRAINING DEVICE

TYPE/USE: Training

COMPONENTS: Sabot M1
22mm subcaliber cartridges (M744, M745, M746, and M747)

REMARKS:

1. Refer to TM 9-1315-249-12&P for additional information and instructions on its use.
2. The M1 SABOT, with any 22MM subcaliber cartridge, WILL NOT be fired unless equipped with Type IV Range Nut Assembly, NSN 1315-01-163-5428. Rapid and condemning tube erosion WILL occur with non-compliance.

Section II. PREPARATION FOR FIRING

1. Unpack cartridge.
 - a. Remove U-shaped packing stop/clip (if any) from fuze (except for M879TP and M880TP(SR) cartridges).

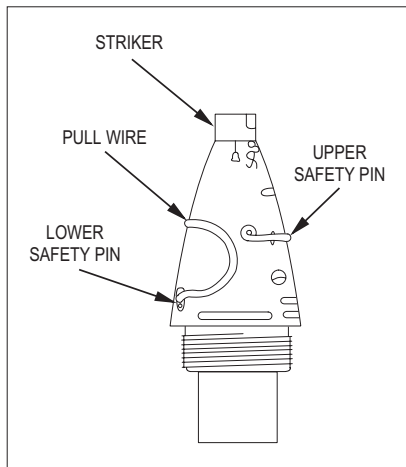
NOTE

Inspect M751 and M775 Practice Fuzes for the presence of fuze packing clip. Clip should remain in place until just prior to firing. If the packing clip is not present, remove cartridge to dud pit and notify Explosive Ordnance Disposal (EOD).

- b. Remove protective bag and desiccant bags (if any) secured to or covering fin assembly.
 - c. Remove plastic shell/insert assembly (if any) covering propelling charge.
2. Assemble fuze to cartridge if cartridge was shipped unfuzed (see sec VII on pg 4-38).
3. Set fuze for required time or desired type of burst (see sec VIII on pg 4-40).
4. Adjust propelling charge for desired range (see sec XII on pg 4-50).

M524 PD Fuzes**WARNING**

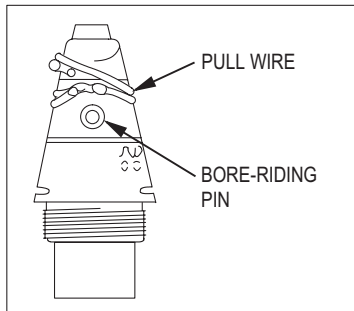
- Do not fire cartridge
 - if eye of upper safety pin breaks off and/or safety pin cannot be removed.
 - if fuze makes a buzzing sound when safety pins are removed.
- Keep cartridge vertical (with fuze end up) if a buzzing sound was heard. Fuze may be armed.
- Notify EOD.



M526 PD Fuzes

WARNING

- Do not fire cartridge
 - if fuze makes a buzzing sound when safety pins are removed.
 - if bore-riding pin is missing.
- Always check for presence of bore-riding pin after removing safety pins.
- Notify EOD.



WARNING

Inspect M751 and M775 Practice Fuzes to ensure that fuze striker is not protruding from nose of fuze so that red stripe is visible. If fuze striker is protruding so that red stripe is visible, fuze may be armed. Force applied to nose of fuze may cause it to function. Remove cartridge to dud pit, taking care not to strike nose of fuze, and notify EOD.

5. Remove safety pin/pull wire (if any) just prior to loading cartridge. Remove packing clip from M751 or M775 Practice Fuze prior to firing.

Section III. LOADING AND FIRING (SEE CHAPTER 2).

WARNING

- Do not fire ammunition through overhead obstructions or over the heads of unprotected personnel.
- The mortar crew must have adequate cover for protection from fragments when firing to ranges of 225 meters or less.
- Do not fire ammunition with damaged fins, leaking or missing propellant containers, damaged obturators, or damaged fuzes.
- All cartridges must be inspected prior to firing for dented, cracked, bent, separated, and loose components. Any cartridge with fins bent (even slightly) or propellant increments that have been punctured or torn (leaking propellant) are to be considered unserviceable, since critical short rounds could result if fired.

Change 6 4-26.1

LOADING AND FIRING - Continued.

WARNING - Continued

- Unpacked mortar cartridges are known to sustain significant damage when dropped. Packed ammunition dropped from a height of more than seven feet could be similarly damaged. Defects incurred may not be detectable by visual inspection, and firing damaged ammunition could result in weapon or property damage or serious personnel injury or death. All cartridges which have been dropped are to be immediately segregated, tagged or marked for identification, and turned in to the ASP as unserviceable.
- PD and proximity fuzes may prematurely function when fired through extremely heavy rainfall.
- Do not fire ammunition in temperatures above +145° F (+63° C) or below -50° F (-46° C).
- Short rounds may occur if an excessive amount of oil or water is in barrel during firing.

Change 6 4-26.2

WARNING - Continued

- **Firing M374A2, M375A1, and M375A2 cartridges in inclement weather (rain/snow) is not advisable. Critical short rounds may occur when propelling charge bags are wet or have previously been exposed to moisture.**

CAUTION

- **Before loading cartridge, ensure that barrel and cartridge are free of sand, mud, moisture, snow, wax, or other foreign matter.**
- **Ensure that all packing materials (packing stops, supports, and plastic bags) were removed from cartridge.**

LOADING AND FIRING – Continued

NOTE

- **Ensure that cartridge has proper amount of charge.**
- **Remove safety wire/clip (if any) before loading.**

See chapter 2 for loading and firing instructions.

ALLOWABLE NUMBER OF ROUNDS PER DAY (ANOR)

To reduce hazards from blast overpressure/impulse noise during firing, the mortar crew is required to use hearing protection. Using the proper head position and single hearing protection, the ANOR that can be safely fired each day are listed below.

800 SERIES AMMUNITION

CHARGE	ELEVATION	ANOR	POINTS PER ROUND
4	800	61	16.0
4	1511	611	1.6
3	800	180	5.5
3	1511	1000+	0.0
2	800	666	1.5
2	1511	856	1.2
1	800	1000+	0.0
1	1511	1000+	0.0

Point values are used to compute exposure limits (1000 pts per day maximum) when a mixture of charges are fired in one 24 hour period.

ALLOWABLE NUMBER OF ROUNDS PER DAY (ANOR) - Continued

300 SERIES AMMUNITION

TYPE	CHARGE	ANOR	POINTS PER ROUND
M301A1/A2	4	50	*
M301A3	8	143	*
M374/A1/A2	9	125	*
M374A3	4	106	*
M375/A1/A2	9	125	*
M375A3	4	106	*

* No reduced charge data or point values are provided for the 300 series ammunition.

NOTE

- ANOR is for TRAINING ONLY, DOES NOT apply in COMBAT.
- All personnel within 100 meters of firing, are required to use hearing protection.
- Proper crew positions are provided on pages c, g, h, and 2-67 of this manual.

Section IV. UNFIRED CARTRIDGES

1. Replace safety wire/clip if removed from fuze.

NOTE

- Install upper safety pin first on M524 and M526 PD Fuzes.
- If safety pins cannot be fully re-inserted into fuze, do not force it. Notify EOD.

2. Reset fuze (see sec IX on pg 4-47).

NOTE

Do not attempt to reset M532 VT fuzes. Fuzes set for PD action cannot be returned to proximity mode.

3. Remove fuze, if cartridge was shipped unfuzed. Re-install closing plug.

UNFIRED CARTRIDGES – Continued.

NOTE

Do not mix propelling models or lots. Use original increments.

4. Re-install propellant increments so that cartridge has a full charge.

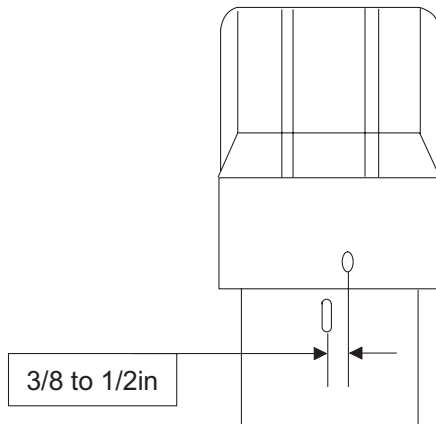
CAUTION

When repacking M821/M899 HE ammunition, tighten monopack cap until a definite stop is felt. This will occur when the sealing wire hole on the cap is between 3/8 to 1/2 inches to the right of the container sealing wire lug (see illustration). Do not tighten further. This may cause cracks in the cap.

NOTE

Replace packing clip on M751 and M775 Practice Fuzes. If packing clip cannot be fully inserted, notify EOD.

5. Install packing stop. Install packing clip on M751 and M775 Practice Fuzes. Repack cartridge.



Section V. CARE AND HANDLING OF CARTRIDGES

1. Do not throw or drop live ammunition.
2. Use proper tools to open ammo boxes and ammo containers.
3. Do not break moisture resistant seal (or jungle-wrap) of ammunition containers until cartridges are to be fired.
4. Protect cartridges when removed from ammo container. Protect ammunition from rain and snow. Do not remove plastic shell insert assembly around propelling charge, until propelling charge is to be adjusted. If protective bags were packed with cartridge, cover fin assembly and propelling charge to prevent moisture contamination. Stack cartridges on top of empty ammo boxes. Cover cartridges with plastic sheets provided.
5. Do not expose cartridges to direct sunlight, extreme temperatures, flame or other sources of heat.
6. Store WP-loaded cartridges at temperatures below 111° F to prevent melting of WP filler. If this is not possible, WP-loaded cartridges must be stored fuze-end up so that WP will

CARE AND HANDLING OF CARTRIDGES - Continued.

resolidify with void space in nose end of cartridge (when temperature returns below 111° F). Failure to observe this precaution could result in rounds with erratic flight.

7. Store WP-loaded ammunition separate from other types of ammunition.
8. Notify EOD of leaking WP cartridges. Avoid contact with any leakers.
9. Protect primer of cartridge during handling.
10. Do not handle duds.
11. Do not transport ammunition which is not properly secured to vehicle.

Section VI. FUZES

Multi-Option, M734 Fuze

FUNCTIONS: Prox/impact

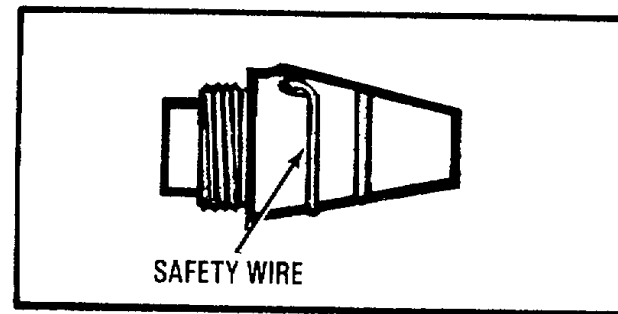
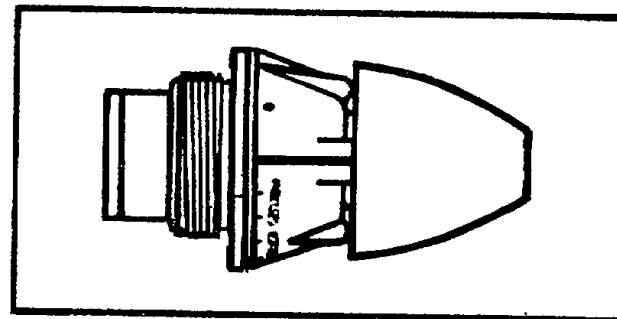
SETTINGS: Prox, near surface burst, impact, or 0.05 second delay action.

POINT DETONATING, M935 FUZE

FUNCTIONS: Impact

SETTINGS: Superquick or 0.05 second delay action.

REMARKS: Fuze has a safety wire.

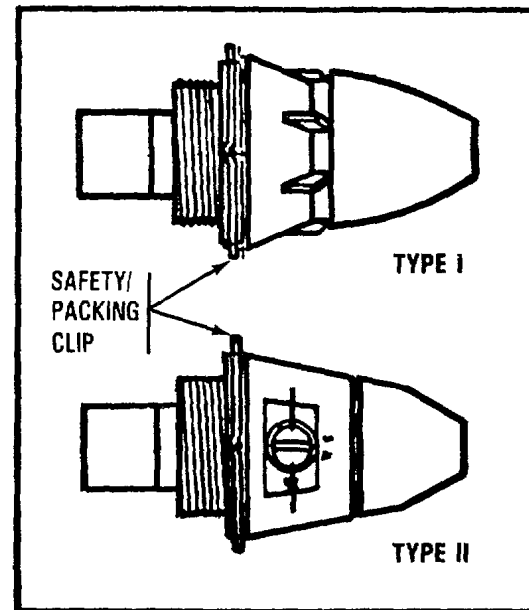


FUZES - Continued.**POINT DETONATING, M751 and M775 FUZE**

FUNCTIONS: Impact

SETTINGS: Dummy multi-option
PRX/NSB/IMP/DLY
(Type I Ogive)
Dummy point detonating
SQ/D
(Type 11 Ogive)

REMARKS: Fuze has a smoke charge and safety/packing clip,

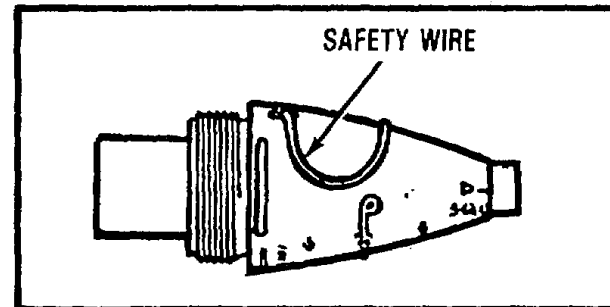


POINT DETONATING, M524 (SERIES) FUZE

FUNCTIONS: Impact

SETTINGS: Superquick or 0.05 second delay action.

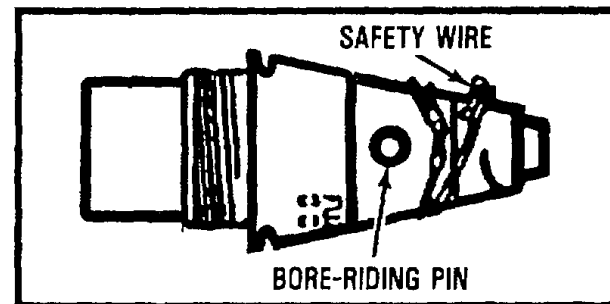
REMARKS: Fuze has a safety wire.

**POINT DETONATING, M526 (SERIES) FUZE**

FUNCTIONS: Impact

SETTINGS: Superquick action only.

REMARKS: Fuze has a safety wire and bore-riding pin.

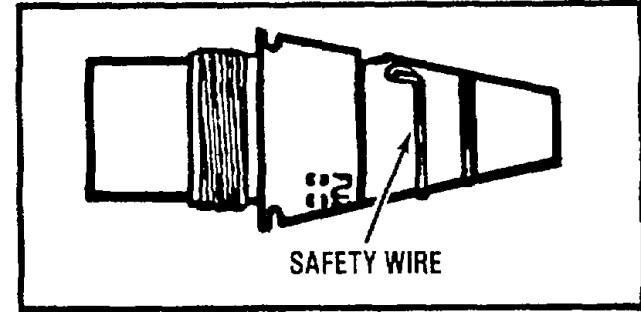


FUZES-Continued,**POINT DETONATING, M587 FUZE**

FUNCTIONS: Impact

SETTINGS: Superquick or 0.05 second delay action.

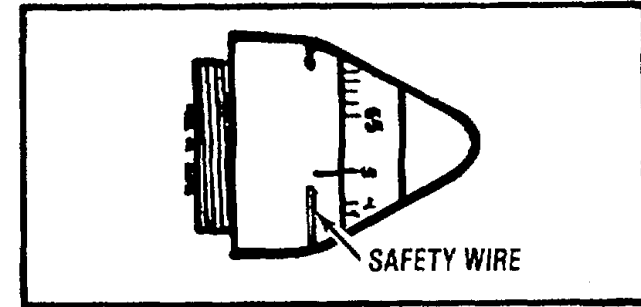
REMARKS: Fuze has a safety wire.

**MECHANICAL TIME SUPEROUICK, M772 FUZE**

FUNCTIONS: Airburst/impact

SETTINGS: 4-55 seconds (1/2 second intervals)

REMARKS: Fuze has an expelling charge and safety wire.



TIME, M768 FUZE

FUNCTIONS: Airburst

SETTINGS: 3-55 seconds (one second intervals)

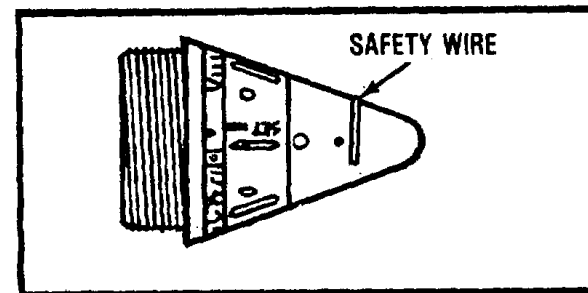
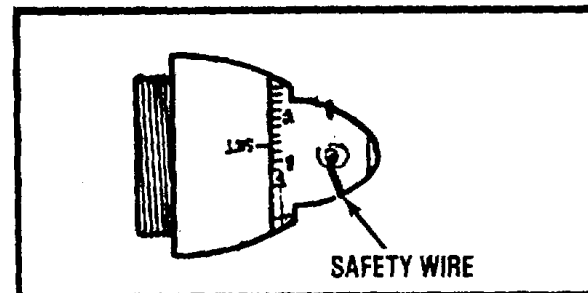
REMARKS: Fuze has an expelling charge and safety wire

TIME, M84 SERIES FUZE

FUNCTIONS: Airburst

SETTINGS: 0-25 seconds (M841)
0-50 seconds (M84A1)

REMARKS: Fuze has an expelling charge and safety wire

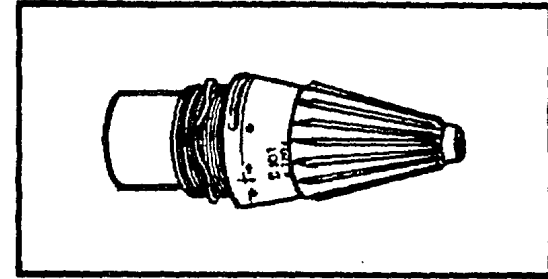


FUZES-Continued.

PROXIMITY (VT), M532 FUZE

FUNCTIONS: Prox/Impact

SETTING: Proximity or superquick action



Section VII. INSTALLATION OF FUZES

WARNING

- Do not hammer on fuze wrench or use an extension on handle.
- Fuze must be fully seated onto projectile body. Do not stake fuze.
- Use only authorized fuze combinations.

1. Place cartridge on its side.
2. Remove closing plug from cartridge. Use a M18 fuze wrench to loosen closing plug. Turn handle of wrench in counterclockwise direction.
3. Inspect fuze threads and fuzewell threads for damage. Do not use fuze if thread is damaged. Do not use projectile if fuzewell thread is damaged or if explosive is visible on thread.
4. Screw fuze into projectile body. Seat fuze and secure it with an M18 fuze wrench. There must be no visible gap between fuze and projectile body.

NOTE

If binding occurs, unscrew fuze and recheck threads.

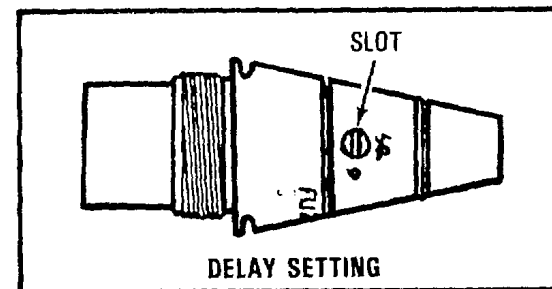
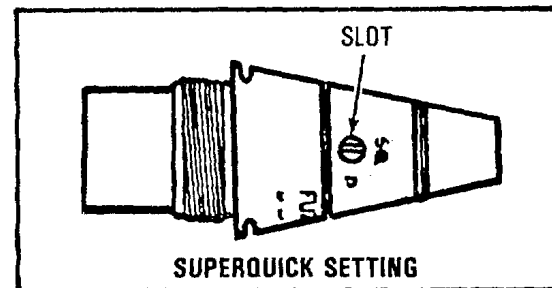
Section VIII. FUZE SETTING

The following chart identifies the proper procedure and required tools/wrenches for setting the fuze:

FUZE									FUZE SETTER (WRENCH)	PROCEDURE
PD				MTSQ	T		MO	VT		
M935 M567	M524	M526	M751 M775	M772	M768	M84	M734	M532		
●									(M18)	1
	●								(M18)	2
		●	●						NONE	3
				●	●				1-3/4 inch open end wrench	4
						●			M25	5
							●		NONE	6
								●	NONE	7

PROCEDURE NO. 1

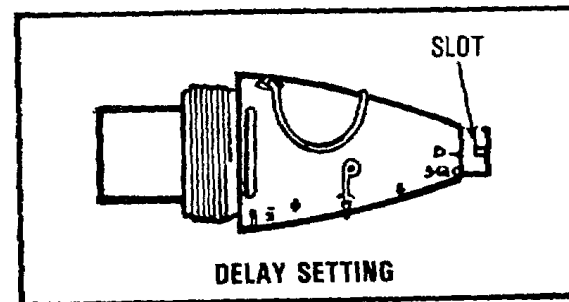
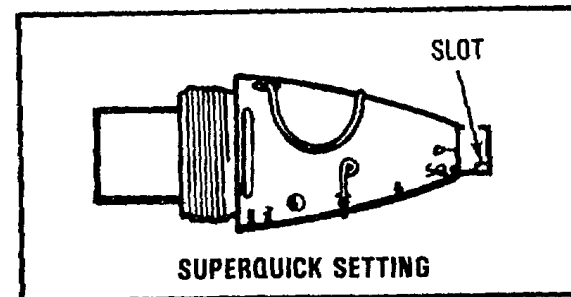
1. Superquick setting.
 - a. These fuzes are shipped pre-set to function superquick on impact.
 - b. Verify setting prior to firing. Selector slot should be aligned with SQ-mark on ogive.
2. Delay setting.
 - a. Turn selector slot in clockwise direction until slot is aligned with 0-marking on ogive.
 - b. Use bladed end of a M18 fuze wrench to change settings.



FUZE SETTING - Continued.**PROCEDURE NO. 2**

1. Superquick setting.
 - a. These fuzes are shipped preset to function superquick on impact.
 - b. Verify setting prior to firing. Slot in striker should be aligned with SQ-marking and notch on ogive.

2. Delay setting.
 - a. Turn striker slot in clockwise direction until slot is aligned with D-marking and line on ogive.
 - b. Use bladed end of M18 fuze wrench to change settings.

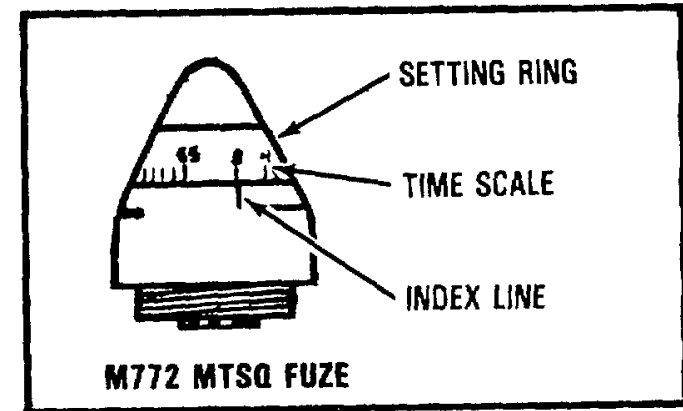


PROCEDURE NO. 3

1. These fuzes function on impact with superquick action only.
2. Remove safety wire from M526 PD Fuze just before firing.
3. Remove safety/packing clip from M751 and M775 PD Fuzes just before firing.
4. No other action is required.
5. M751 and M775 PD Fuzes have dummy multi-option -- PRX/NSB/IMP/DLY or dummy PD -- SQ/D settings (for practice only).

PROCEDURE NO. 4

1. Rotate setting ring or head of fuze in clockwise direction until correct line and number of seconds on time scale is aligned with index line.
2. Use wrench NSN 5120-00-203-4801 or a 1-3/4 inch open-end wrench to turn setting ring or head of fuze.

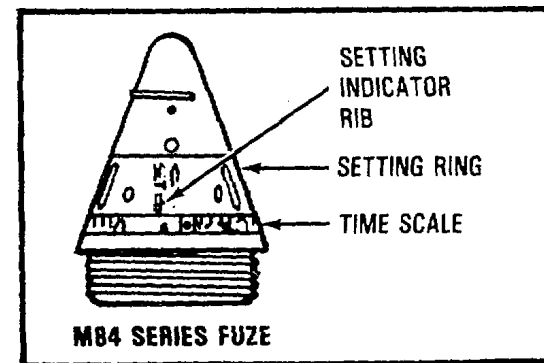
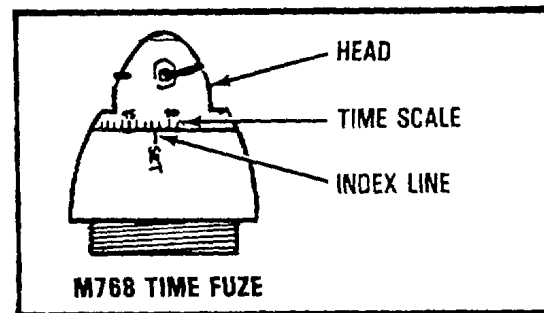


FUZE SETTING - Continued.

3. See firing tables for correct time settings.

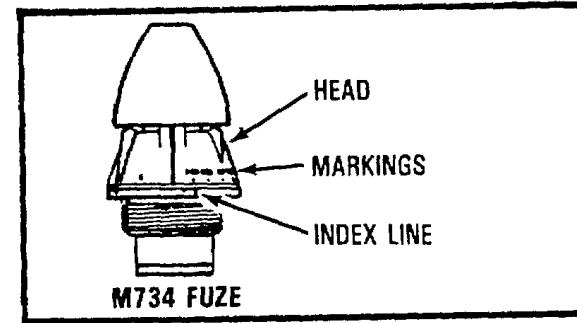
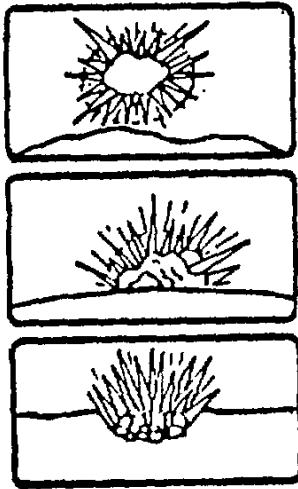
PROCEDURE NO. 5

1. Rotate setting ring in counterclockwise direction until setting indicator rib (marked set) is aligned with correct line (boss) and number of seconds of time scale.
2. Use a M25 fuze setter to turn the setting ring.
3. See firing tables for correct time setting.



PROCEDURE NO. 6

1. Fuzes can be set by hand.
2. Set fuze by rotating fuze head (in clockwise direction) until correct marking (PRX, NSB, IMP, or DLY) is over index line.
3. Next illustration depicts burst types.



PRX - Proximity. The fuze comes set to PRX. (Burst height is 3-13 ft.)

NSB - Near Surface (non jamming)
(Burst height is 0-3 ft.)

IMP - Impact (SQ)

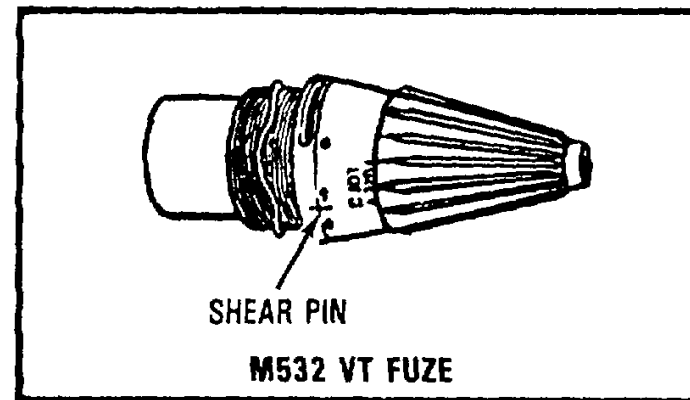
DLY - Delay (0.050 seconds)

FUZE SETTING - Continued.**PROCEDURE NO. 7**

1. Proximity setting - Use fuze as shipped.

NOTE

Examine shear pin of fuze to determine if it may once have been set for PD action. Fuzes set for PD action cannot be returned to PROX mode. Fuzes with broken shear pins may function PD instead of PROX.



2. PD Setting - Rotate nose of fuze (by hand) at least 1/3 turn (120 degrees) in either direction.

Section IX. RESETTING FUZES

M935 and M567 PD Fuzes - Align selector slot with SQ-marking on ogive.

M524 (series) PD Fuzes - Align slot in striker with SQ-marking and notch in ogive.

M526, M751, and M775 PD Fuzes - None.

M772 MTSQ and M768 Time Fuzes - Rotate setting ring or head of fuze until S-line of time scale is aligned with index ring.

M84 (series) Time Fuzes - Rotate setting ring in counterclockwise direction (only) until setting indicator rib is aligned with S-marking of time scale.

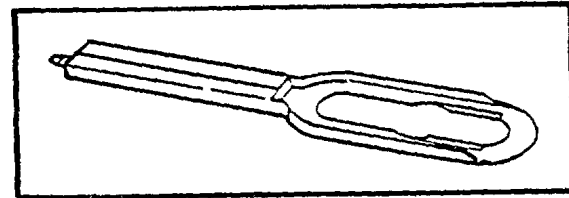
M734 Multi-option Fuze - Rotate head of fuze in counterclockwise direction until PRX-marking is over index line.

M532 VT Fuze - Do not reset this fuze.

Section X. FUZE WRENCH/SETTERS

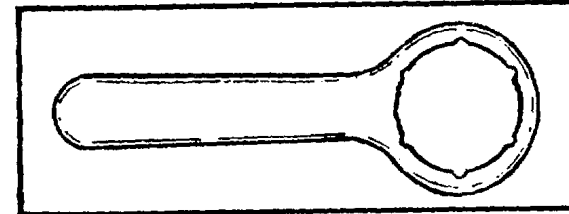
M18 FUZE WRENCH

1. Wrench for assembling fuze to cartridge.
2. Bladed tip on end for setting PD type fuzes.



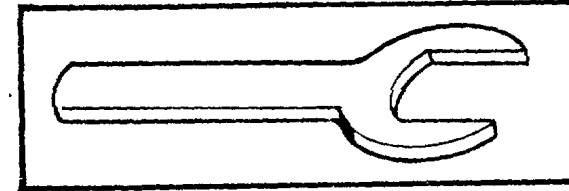
M25 FUZE SETTER

1. Sets M84 series time fuzes.
2. Notches in setter engages ribs in setting ring of fuze.



FUZE SETTING WRENCH (NSN 5120-00-203-4801)

1. Sets M772 MTSQ and M768 time fuzes
2. Engage 1-3/4 inch flats on setting ring or head of fuze.



Section XI. PROPELLING CHARGE

MODEL NO.	NO. OF INCREMENTS	TYPE OF CONTAINER
M2A1	4	Cellophane bags
M5 and M185	8	Water-repellant cotton (cloth) bags
M90	1-Charge A 8-Charge B	Water-repellant cotton (cloth) bags
M90A1	1-Charge A 8-Charge B	Silk or acrylic (acetate laminated) cloth bags
M205, M218, M219, M220, and M223	4	Nitrocellulose/fiber containers (horseshoe-shaped)

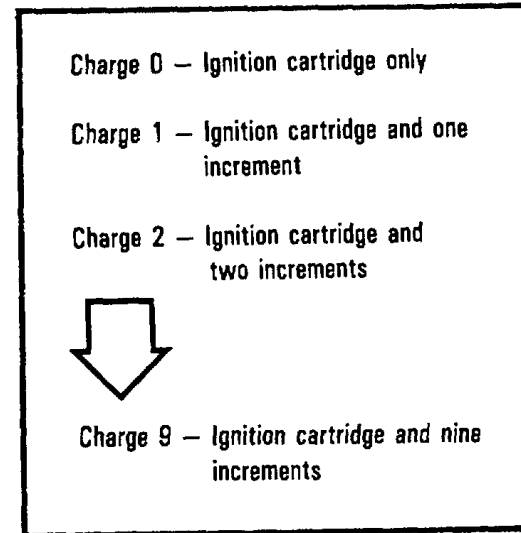
Section XII. ADJUSTMENT OF PROPELLING CHARGE

WARNING

- **Propelling charges are not interchangeable. Do not substitute one model for another. Do not mix lots.**
- **Reposition remaining propellant increments towards rear of fin assembly when firing M821 HE, M889 HE, M374A3 HE, M375A3 WP, M819 RP, M853 illum or M879 TP cartridges with less than full charge (4 increments)**
- **Charge A increment of the M90, and M90A1 propelling charge must be used when firing above charge 0.**

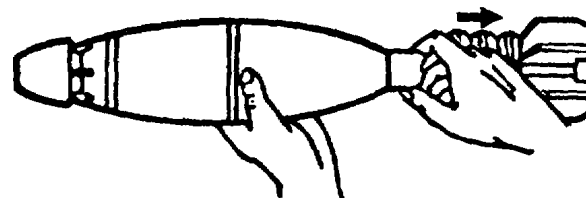
1. Cartridges are shipped with a complete propelling charge and ignition cartridge/primer.
2. Use firing table to determine proper charge for firing.

3. With exception of M880 TP cartridge, M68 training cartridge, and sabot training device, reduce range of cartridge by removing appropriate number of increments from fin assembly. Adjacent chart shows number of increments that should be remaining.



ADJUSTMENT OF PROPELLING CHARGE - Continued.

4. Slide remaining increments towards until charge is against fins (M821 HE, M889 HE, M374A3 HE, M375A3 WP, M819 RP, M853 Illum and M879 TP cartridges only). Failure to reposition increments could result in improper ignition and a short round.
5. Reduce range of M880 TP cartridge by removing plastic plugs from projectile body. Adjacent chart shows number of plugs that should be remaining.
6. Place excess increments in an empty ammunition box for protection. Close lid of box during firing to prevent accidental ignition from burning debris/residue.



Charge 0 — Ignition cartridge only

Charge 1 — Ignition cartridge and one plug

Charge 2 — Ignition cartridge and two plugs

Charge 3 — Ignition cartridge and three plugs

Section XIII. UNUSED PROPELLING CHARGE INCREMENTS

WARNING

When burning excess increments:

- **Burning area must be at least 100 meters from the nearest mortar position, parked vehicles and ammunition piles.**
- **Burning area shall be cleared of all dead grass or brush within 30 meters.**

1. Excess increments should be destroyed daily.
2. Destroy increments by burning.
3. Place increments on the ground. Form a row 4 to 6 inches wide and as long as necessary. Do not pile increments more than 1 to 2 inches high.

UNUSED PROPELLING CHARGE INCREMENTS-Continued,

4. End train of increments with a row of single increments, followed by at least a meter of dry grass or dead leaves.
5. Ignite dry grass or leaves.
6. Allow ensuing fire to self-extinguish.

CHAPTER 5

FOREIGN AMMUNITION (NATO)

Section I. GENERAL

As a result of recent agreements, the United States (US) and a number of its NATO allies intend to establish the interoperability of many weapons systems and ammunition of the various countries. The goal is to enable the safe and effective firing of major types of ammunition of the same size from the same compatible size and type weapon of the NATO armies. Interoperability criteria are now required for many weapons and ammunition items in current development. Determinations are now being made to establish which ammunition items will be authorized for use in US weapons by changes to the applicable ammunition and weapons manuals. NATO nations will provide similar authorization in their manuals. Only authorized NATO ammunition will be used. Those items covered in the manual have been authorized. If a munitions item has not been authorized, it is because (1) it has not yet been determined to be safe to fire from a US weapon or (2) it has been determined that the munitions item cannot be safely fired from the US weapon system.

Section II. AUTHORIZED CARTRIDGES

1. The following NATO ammunition can be fired in the 81MM M252 mortar:

NATION	ITEM
United Kingdom (UK)	Cartridge 81MM-HE, L15A4

2. Cartridge, 81MM-HE, L15A4 is assembled with Fuze, PD L35A1 and Propelling Charge, MK2.

Section III. FUZE SETTING

1. Fuze, PD L35A1 functions on impact with superquick or delay action.
2. Align selector slot with SQ-marking or D-marking for desired action.
3. Remove safety pin just prior to firing.

Section IV. ADJUSTMENT OF PROPELLING CHARGE

1. The MK2 (UK) Propelling Charge System is comprised of the following:
 - a. Three L32A1 Augmenting Cartridges (increments) placed next to the fins.
 - b. Three L34A2 Augmenting Cartridges (increments) placed next to the projectile body.
 - c. An L33A1 Primary Ignition Cartridge.
2. Adjust range of cartridge by removing appropriate no. and type of increments (see following chart).

Charge 6 - All augmenting cartridges (increments) in place.
Charge 5 - One L34A2 augmenting cartridge (increment) removed.
Charge 4 - Two L34A2 augmenting cartridges (increments) removed.
Charge 3 - Three L34A2 augmenting cartridges (increments) removed.
Charge 2 - Three L34A2 augmenting cartridges (increments) and one L32A1 augmenting cartridge (increment) removed.
Charge 1 - Three L34A2 augmenting cartridges (increments) and two L33A1 augmenting cartridges (increments) removed.
Primary Charge (Charge 0) only - All augmenting cartridges (increments) removed.

APPENDIX A

REFERENCES

SCOPE. This appendix lists all forms, technical manuals, field manuals, miscellaneous publications, and USMC publications and forms referenced in this manual.

FORMS

DA Form 2028.....	Recommended Changes to Equipment Publications and Blank Forms
DA Form 2062.....	Hand Receipt/Annex Number
DA Form 2404.....	Equipment Inspection and Maintenance Worksheet
DA Form 2408-4	Weapon Record Data
SF 368.....	Quality Deficiency Report

TECHNICAL MANUALS.

TM 9-1015-249-10-HR.....	Hand receipt covering content of components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization list (AAL) for M252, 81-MM Mortar (1015-01-164-6651)
--------------------------	--

TM 9-1220-243-12&P	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Plotting Board, Indirect Fire, M16 W/E (1120-00-601-7491) and M19 W/E (1220-01-059-7989)
TM 9-1240-278-12	Operator and Organizational Maintenance Manual: Sight, Bore, Optical M45 (T151E) (NSN 1240-00-690-8811)
TM 9-1300-206	Ammunition and Explosives Standards
TM 9-1315-249-12&P	Operator's and Organizational Maintenance Manual (including Repair Parts and Special Tools List) for 81-MM Mortar Training Device 81-MM Sabot (Inert) M1 and 22-MM Subcaliber Practice Cartridges M744, M745, M746, and M747
TM 9-1315-252-10	Operator's Manual for Cartridge, 81-MM, Target Practice (SR), M880
TM 9-6920-212-14	Operator and Organizational Maintenance Manual for Trainer Mortar, Pneumatic, M32A1 W/E (6920-00-045-6537)
TM 43-0001-28-3	Army Ammunition Data Sheets for Artillery Ammunition: Gun, Howitzers, Mortars, Recoilless Rifles and Grenade Launchers (Federal Supply Class 1310, 1315, 1320, 1390)

FIELD MANUALS.

FM 3-4	NBC Protection
FM 3-5	NBC Decontamination

ARMY TM 9-1015-249-10

FIELD MANUALS - Continued.

FM 3-87	Nuclear, Biological, and Chemical (NBC) Reconnaissance and Decontamination Operations (How to Fight)
FM 4-25.11	First Aid
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65° F)
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations

MISCELLANEOUS PUBLICATIONS.

CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (except: Medical, Class V Repair Parts, and Heraldic Items)
10 CFR Part 19.....	Notices, Instructions, and Reports to Workers; Inspections
10 CFR Part 20.....	Standards for Protection Against Radiation
DA PAM 750-8.....	The Army Maintenance Management System (TAMMS) Users Manual

USMC PUBLICATIONS AND FORMS.

MCO 4855.10	Quality Deficiency Report Manual
NAVMC Form 10558A.....	Weapon Record Book
NAVMC Form 10772	Recommended Changes to Technical Publications
TM 4700.15/1.....	Equipment Record Procedures

APPENDIX B
COMPONENTS OF END ITEMS AND
BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

SCOPE.

This appendix lists components of end item and basic issue items for the 81-mm mortar to help you inventory items required for safe and efficient operation.

GENERAL.

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item (COEI). This listing is for information purposes only and is not authority to requisition replacements. These items are part of the end item but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

GENERAL - Continued.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the 81-mm mortar in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the 81-mm mortar during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

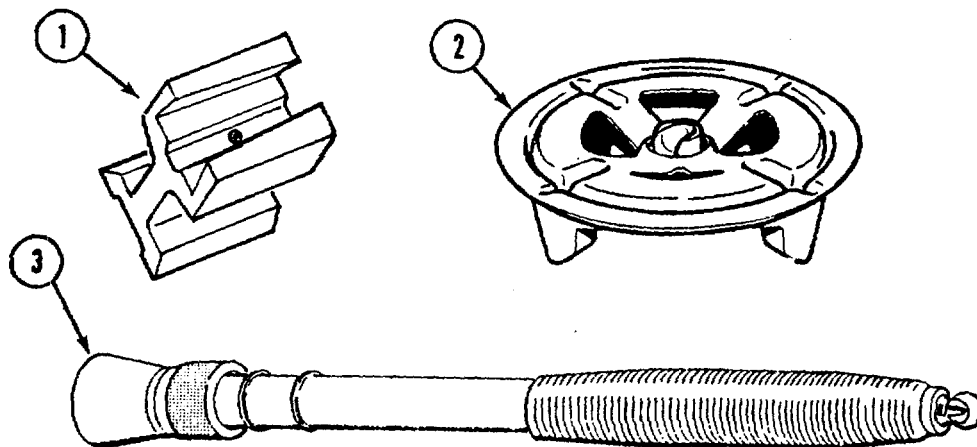
EXPLANATION OF COLUMNS.

The following provides an explanation of columns in the tabular listings:

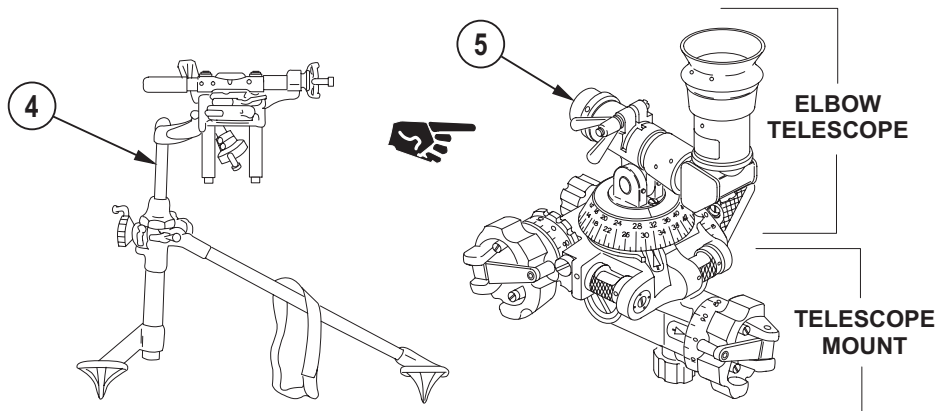
- a. Column (1) - Illustration Number (Illus Number). Indicates the number of the illustration in which the item is shown.

- b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.
- c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the CAGEC (in parentheses) followed by the part number.
- d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea., in., pr).
- e. Column (5) - Quantity Required (Qty Rqr). Indicates the quantity of the item authorized to be used within the equipment.

Section II. COMPONENTS OF END ITEM

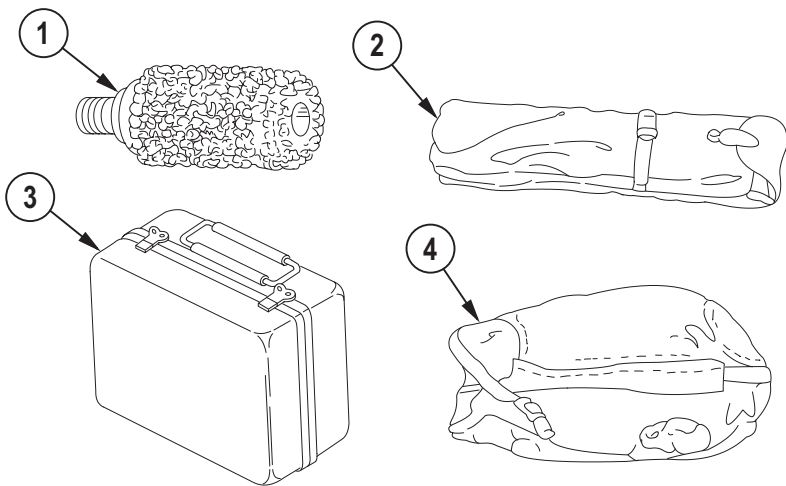


(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number Usable On Code	(4) U/M	(5) Qty Rqr
1	1015-01-211-4045	ADAPTER ASSEMBLY (19200) 9362653	EA	1
2	1015-01-236-0389	BASEPLATE, M3A1 (19206) 11579870	EA	1
3	1015-01-440-5935	CANNON, MORTAR, 81-MM, M253 (19206) 11580048	EA	1

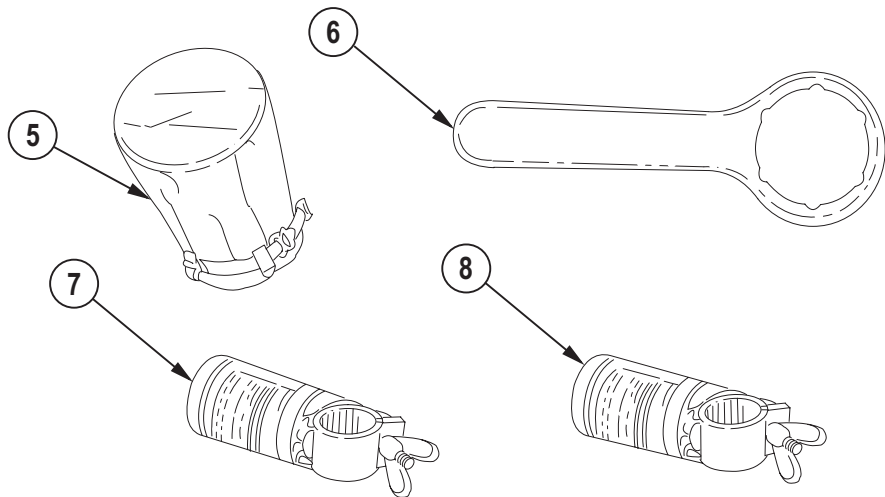


(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
4		MOUNT, MORTAR, M177 (19206) 11579803		EA	1
5		SIGHT UNIT, M67 (19200) 9356182 Consists of: 6650-01-340-6082 MOUNT, TELESCOPE (19200) 9356166 6650-01-341-5195 TELESCOPE, ELBOW (19206) 9356181		EA	1

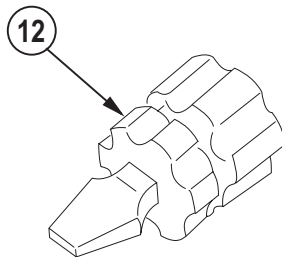
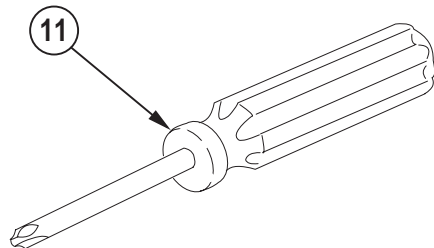
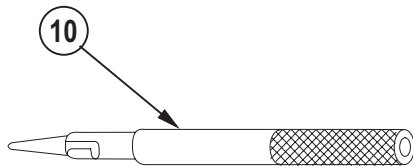
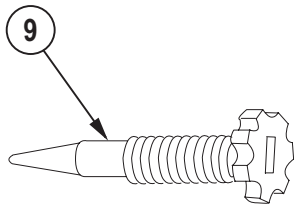
Section III. BASIC ISSUE ITEMS



(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number Usable On Code	(4) U/M	(5) Qty Rqr
1	1015-01-441-4161	BRUSH SECTION (19206) 11580239	EA	1
2	1290-01-043-8288	CASE, AIMING POST (19206) 11733755	EA	1
3	1240-01-372-1352	CASE, SIGHT UNIT (19206) 12950820	EA	1
4	1240-01-043-7502	COVER, FIRE CONTROL (19200) 11733753	EA	1

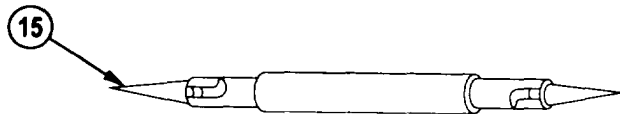
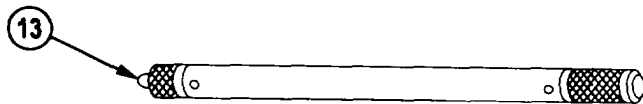


(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
5	1015-01-441-4159	COVER, MUZZLE (19206) 11580230		EA	1
6	1290-00-767-6038	FUZE SETTER, M25 (19200) 7676038		EA	1
7	1290-00-169-1934	LIGHT, AIMING POST: M58 (green) (19200) 12961204		EA	2
8	1290-00-169-1935	LIGHT, AIMING POST: M59 (orange) (19200) 12961205		EA	1

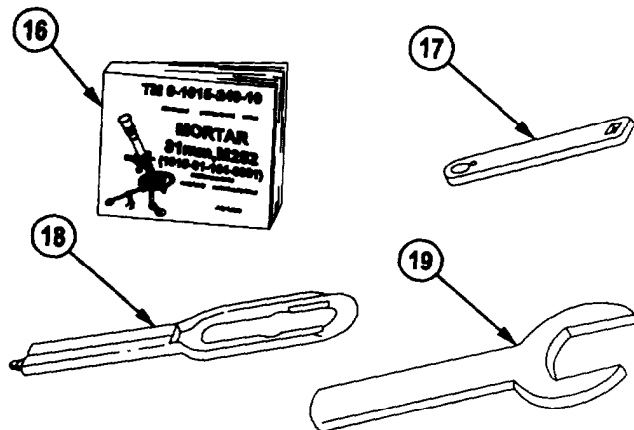


ARMY TM 9-1015-249-10

(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
9	1015-01-441-4160	PIN, FIRING (19206) 11580037		EA	2
10	1290-01-046-8320	POST, AIMING, M14 (19200) 11736201		EA	16
11	5120-00-820-2995	SCREWDRIVER, CROSS TIP (81348) GGG-S-121		EA	1
12	5120-00-010-7914	SCREWDRIVER, FLAT TIP (81348) GGG-S-121		EA	1

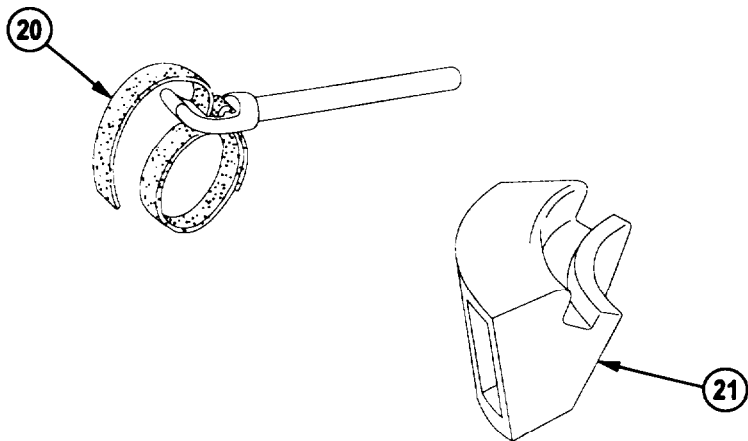


(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
13	1015-01-441-3112	STAVE SECTION. END (19206) 11580242		EA	1
14	1015-01-441-3113	STAVE SECTION, INTERMEDIATE (19206) 11580241		EA	3
15	1010-01-043-8195	STAKE, DRIVING, AIMING POST (19200) 11741788		EA	2



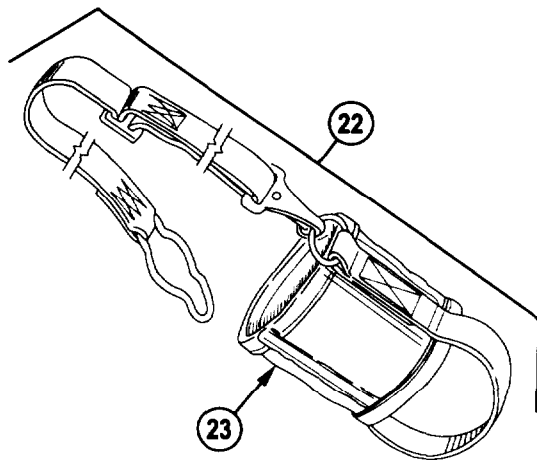
ARMY TM 9-1015-249-10

(1) Illus Num- bar	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
16		TM 9-1015-249-10		EA	1
17	5120-01-442-2311	WRENCH, FIRING PIN (19206) 11580236		EA	1
16	4933-00-723-1161	WRENCH, FUZE, M18 (19206) 7231161		EA	1
19	5120-00-203-4801	WRENCH, FUZE SETTING, 1-3/4 inch (58536) A-A-1353		EA	1

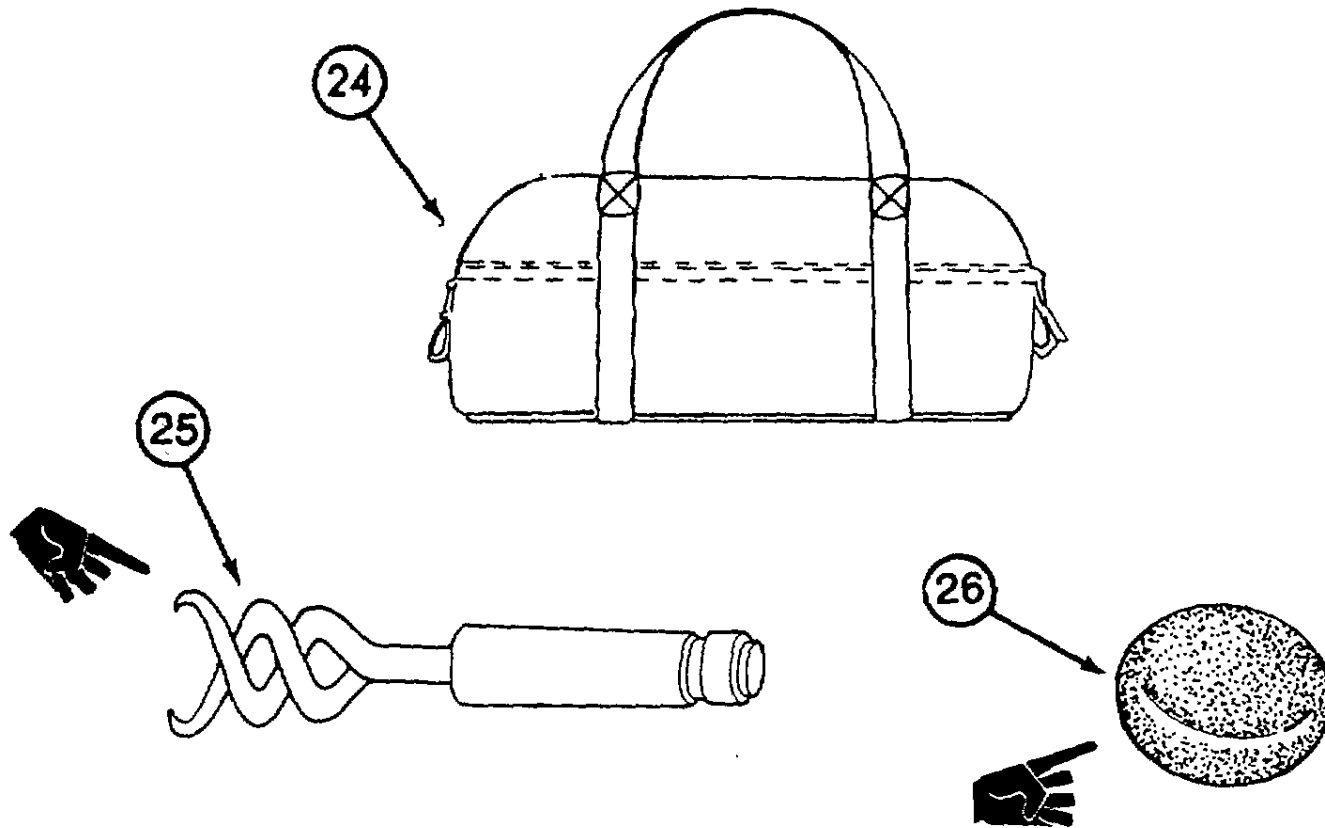


ARMY TM 9-1015-249-10

(1) Illus Num- ber	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/M	(5) Qty Rqr
20	5120-00-262-8491	WRENCH, PIPE, STRAP (19207) 5576345		EA	1
21	4933-01-441-5496	EXTRACTOR, BASEPLATE (19206) 11580238		EA	1



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
22	1015-01-288-6771	SLING ASSEMBLY (19206) 11580120		EA	1
23	1015-01-305-3143	COVER, MUZZLE (19206) 11580206		EA	1



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
24	5140-00-473-6256	BAG, TOOL (SATCHEL) (19206) 11655979		EA	1
25	1015-99-961-7602	HEAD SECTION, CLEANING (K3743) MR 821A		EA	1
26	1015-99-961-8458	CLEANING PAD, WIRE MESH (K3743) CM240		EA	1

APPENDIX C
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

SCOPE.

This appendix lists additional items you are authorized for the support of the 81-mm mortar.

GENERAL.

This list identifies items that do not have to accompany the 81-mm mortar and that do not have to be turned in with it. These items are all authorized to you by CTA, TOE/MTOE, Table of Distribution Allowances (TDA), or Joint Table of Allowances (JTA).

EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NUMBER	(3) USABLE ON CODE U/M	(4) QTY AUTH
8105-00-285-4744	BAG, SAND (81349) MIL-B-12233	EA	1
7510-00-889-3494	BINDER, LOOSELEAF (19207) 11677003	EA	1
1220-00-602-7941	BOARD, PLOTTING: M16 (19200) 8270330	EA	1
1240-00-152-3512	BORESIGHT: M45A1 (19200) 10549221	EA	1

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NUMBER	(3) U/M	(4) QTY AUTH
1240-00-152-2916	CASE, BORESIGHT: M102 (19200) 10549222	EA	1
1220-00-613-8532	CASE, PLOTTING BOARD: M105 (19200) 7680317	EA	1
1290-01-067-0687	CIRCLE, AIMING, M2A2 (19200) 11785090	EA	1
1290-00-930-4260	COMPASS MAGNETIC, M2 (19200) 10547166	EA	1

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NUMBER	(3) USABLE ON CODE U/M	(4) QTY AUTH
4930-00-537-8977	OILER, HAND (96906) MS 15766-1	EA	1
1220-01-215-9410	SCALE, CIRCULAR FIRING (for M821/M889 rounds) (19200) 9395870	EA	1
1220-01-242-2428	SCALE, CIRCULAR FIRING (for M819 round) (19200) 12556017	EA	1

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION		(3)	(4)
	CAGEC AND PART NUMBER	USABLE ON CODE	U/M	QTY AUTH
1200-01-242-2427	SCALE, CIRCULAR FIRING (for M853 round) (19200) 12556016		EA	1
1220-01-242-2429	SCALE, CIRCULAR FIRING (for M879 round) (19200) 12556018		EA	1
5120-00-278-1269	SCREWDRIVER, FLAT TIP (81348) GGG-S-121		EA	1

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NUMBER	(3) USABLE ON CODE U/M	(4) QTY AUTH
5120-00-180-0728	SCREWDRIVER, JEWELER'S SWIVEL KNOB (81348) GGG-S-1808	EA	1
6675-00-240-1881	TRIPOD, SURVEYING (for arctic use only) (81349) MIL-T-11674	EA	2

APPENDIX D
EXPENDABLE/DURABLE SUPPLIES
AND MATERIALS LIST

Section I. INTRODUCTION

SCOPE.

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the 81-mm mortar. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items) or CTA 8-100, Army Medical Department Expendable/Durable Items.

EXPLANATION OF COLUMNS.

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 9, app D").

- b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item (e.g., C - Operator/Crew).
- c. Column (3) - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.
- d. Column (4) - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.
- e. Column (5) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea., in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	6810-00-201-0906	ALCOHOL, DENATURED (81348) OE-760	PT
2	C	8150-00-269-4662	BAG, PLASTIC (81349) MIL-B-117 Pkg. of 100	EA
3	C	7920-00-205-2401	BRUSH, CLEANING TOOL AND PARTS: Chinese bristle, rd (81349) MIL-B43871	EA
4	C	8020-00-242-7266	BRUSH, PAINT: 3 in. Size (96906) MS16866	EA

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
5	C C	6850-00-227-1887 6850-00-392-9751	CLEANING COMPOUND, OPTICAL LENS: Liquid (81349) MIL-C-43454 1 qt bottle 2 oz bottle	QT OZ
6	C C	6850-00-224-6657 6850-00-224-6663	CLEANING COMPOUND, RIFLE BORE (RBC) Solution type (81349) MIL-C-372 8 oz can 1 gal can	OZ GL
7	C	5350-00-221-0872	CLOTH, ABRASIVE: Crocus (58536) A-A-1206 50 sheet package	SH

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
8	C	6850-00-281-1985	DRY CLEANING SOLVENT (SD) (58536) A-A-711 1 gal can	GL
9	C	8010-10-229-7546	POLYURATHANE COATING, GREEN (81349) MIL-C-53039 1 qt can	QT
10	C	8415-00-266-8675	GLOVES, CHEMICAL AND SOLVENT RESISTANT (81348) ZZ-G-381	PR
11	C	8010-00-582-5382	LACQUER, BLACK (87187) 1602	PT

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
12	C	9150-00-231-2361	LUBRICATING OIL, GENERAL PURPOSE (81349) MIL-L-3150	QT
13	C	9150-00-292-9689	LUBRICATING OIL, WEAPONS (LAW) (81349) MIL-L-14107 1 qt can	QT
14	C	6640-00-663-0832	PAPER, LENS: tissue sheet form (81348) NNN-P-40	EA

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
15	C	7920-00-205-1711	RAG, WIPING (81348) A-A-531 50 lb bale	LB
16	C	8010-00-181-8080	THINNER, SYNTHETIC (85570) 020X304 1 pt can	PT
17	C	9905-00-257-2746	INSTRUCTION DECAL (19200) 11731011	EA

ALPHABETICAL INDEX

SUBJECT	PAGE
A	
Additional Authorization List	C-0
Adjustment of Propelling Charges	4-50, 5-3
Ammunition	4-0
Assembly and Preparation for Firing	
Boresighting with M67 Sight Unit	2-42
Emplacement of Mortar	2-29
Installation of M67 Sight Unit.....	2-40
B	
Basic Issue Items List.....	B-8
Boresighting with M67 Sight Unit.....	2-42
C	
Care and Cleaning of Optical Parts	3-15
Care and Handling of Cartridges	4-31
Components of End Item	B-4
Components of End Item and Basic Issue Items List	B-1

SUBJECT	PAGE
D	
Description and Use of Operator's Controls and Indicators.....	2-0
Disassembling Mortar and Equipment.....	2-79
E	
Emplacement of Mortar	2-29
Emplacing Aiming Posts for Indirect Fire.....	2-58
Equipment Characteristics, Capabilities, and Features.....	1-3
Equipment Data	1-8
Equipment Description.....	1-3
Establishing Alternate Aiming Line	2-59
Expendable/Durable Supplies and Materials List	D-0
F	
Foreign Ammunition (NATO)	5-1
Fuzes	4-33
Fuze Setting.....	4-40,
	5-2
Fuze Wrench/Setters	4-48
G	
General Information	1-1

ALPHABETICAL INDEX (cont)

SUBJECT	PAGE
H	
Hand Receipt (-HR) Manual	1-1
I	
Installation of Fuzes	4-38
■ Installation of M67 Sight Unit	2-40
L	
Loading and Firing	2-65, 4-27
Location and Description of Major Components	1-4
■ Log Book Entries after Firing	2-68
Lubrication Instructions	3-1
M	
Maintenance Forms and Records	1-1
Maintenance Instructions	3-1
Maintenance Procedures	3-14
Major Components, Location and Description of	1-4
Misfire	2-68.1

N

Nomenclature Cross-Reference List.....	1-3
--	-----

O

Operating Instructions.....	2-0
Operating Procedures	
Emplacing Aiming Posts for Indirect Fire.....	2-58
Establishing Alternate Aiming Line	2-59
Loading and Firing.....	2-65
Misfire	2-68.1
Operation of M67 Sight Unit	2-60
Operation Under Unusual Conditions	2-84
Operation Under Usual Conditions	2-29
Operator's Controls and Indicators, Description and Use of.....	2-0
Optical Parts, Care and Cleaning of	3-15

P

Preparation for Firing.....	2-29,
	4-24
Preparation for Movement-Disassembling Mortar and Equipment.....	2-79
Preventive Maintenance Checks and Services (PMCS).....	2-7
Propelling Charges	4-49

ALPHABETICAL INDEX (cont)

SUBJECT	PAGE
R	
References	A-0
Reporting Equipment Improvement Recommendations (EIRs).....	1-2
Reporting Errors and Recommending Improvements	i
Resetting Fuzes	4-47
S	
Scope.....	1-1
T	
Technical Principles of Operation	1-10
Troubleshooting Procedures	3-5
U	
Unfired Cartridges.....	4-29
Unused Propelling Charge Increments.....	4-53
W	
Warnings.....	inside front cover

*US. GOVERNMENT PRINTING OFFICE: 1995-646-043/00094

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE
DOPE ABOUT IT ON THIS
FORM, CAREFULLY TEAR IT
OUT, FOLD IT AND DROP IT
IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

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IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

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DA FORM 2028-2
1 JUL 79

PREVIOUS EDITIONS
• ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR
RECOMMENDATION, MAKE A CARBON COPY OF THIS
AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG PREPARED LINE

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